POLARplus Manager User Guide

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Revision History

Rev.	Date	By:	Description
V1.3	Sep 7th 05	MAM	First English version (V5.0)
V1.4	Sep 29th 05	MAM	Version 5.1
V1.5	Oct 21th 05	MAM	Version 5.4
V1.6	Nov 14th 05	MAM	Version 6.0
V1.7	Jan 25th 06	MAM	Version 6.3.6
V1.8	March 22th 06	MAM	Version 6.7
V1.9	May 31st 06	SIDSA	Update format
V1.10	Jul 19th 06	MAM	Version 6.13
V2.0	Dic 15th 06	MAM	Change of “EtherTV Config Tool” by “POLARplus Manager” and inclusion of URSUS transcoder
V2.1	June 6th 07	MAM	Included KeyFly CDN devices (Content protection devices)
V2.2	Aug 9th 07	MAM	Included VegaMux devices
V2.3	May 20th 08	MAM, JLG	Included DVBS2 EtherTV, Redundancy management, new EtherTV Bridge configuration
V2.4	Jul 28th 08	MAM	New licence policy
		CSP	SAP configuration, Quality , BER and power parameters
V2.5	Dic 30 th 08	DHC	EtherTV Deluxe and new VegaMUX features (CAS, Automatic PID remapping and SI tables)
V2.6	May 6 th 09	DHC	Included ORION Receiver/Encapsulator and etherTV-BIN
V2.7	Jun 9 th 09	DHC	Minor changes (with CI decrypted channels depend on CAM, network interface at PpM installation)
V2.8	Nov 12th 09	VMV	Added EtherTvMux + OFDM
		GRC	Added SNMP Management
V2.9	Feb 22nd 10	VMV	Added EtherTvBridge + OFDM
V3.0	Mar 31st 10	VMV	Added VegaMux with CSA option

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1 Introduction

POLARplus Manager is an application that allows the **search**, **monitoring** and **configuration** of the POLARplus devices, classified in the following groups:

a) DVB-IP Gateways:
   - **etherTV - S**
   - **etherTV - S2**
   - **etherTV - T**
   - **etherTV - C**
   - **etherTV - ASI**
   - **etherTV - BIN**

b) IP-DVB Gateways:
   - **etherTV Bridge**

c) Encoders / Transcoders:
   - **ursus Transcoder**

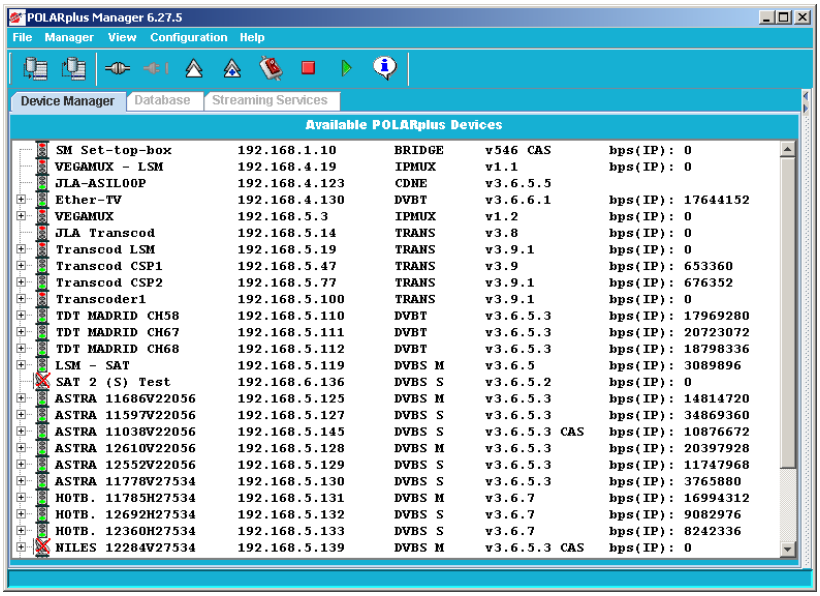
d) IP Multiplexers:
   - **etherTV Mux**
   - **vega Mux**

e) Distribution Devices:
   - **Orion Encapsulator**
   - **Orion Receiver**

f) Content Protection Devices:
   - **KeyFly CDN Encrypter**
   - **KeyFly CDN Decrypter**

In order to know in more detail about the fundamentals of these devices, you can see the following document: “POLARplus Devices.pdf”.

The *POLARplus Manager* detects automatically the different POLARplus devices and displays them in the main window (“Device Manager” tab). The main information associated to a POLARplus device is showed in each line.


POLARplus Manager 6.27.5
File Manager View Configuration Help
Device Manager
Database
Streaming Services
Available POLARplus Devices
SM Set-top-box 192.168.1.10 BRIDGE v546 CAS bps(IP): 0
VEGAMUX - LSM 192.168.4.19 IPMUX v1.1 bps(IP): 0
JLA-ASIL00P 192.168.4.123 CDNE v3.6.5.5
Ether-TV 192.168.4.130 DVBT v3.6.6.1 bps(IP): 17644152
VEGAMUX 192.168.5.3 IPMUX v1.2 bps(IP): 0
JLA Transcod 192.168.5.14 TRANS v3.8 bps(IP): 0
Transcod LSM 192.168.5.19 TRANS v3.9.1 bps(IP): 0
Transcod CSP1 192.168.5.47 TRANS v3.9 bps(IP): 653360
Transcod CSP2 192.168.5.77 TRANS v3.9.1 bps(IP): 676352
Transcoder1 192.168.5.100 TRANS v3.9.1 bps(IP): 0
TDT MADRID CH58 192.168.5.110 DVBT v3.6.5.3 bps(IP): 17969280
TDT MADRID CH67 192.168.5.111 DVBT v3.6.5.3 bps(IP): 20723072
TDT MADRID CH68 192.168.5.112 DVBT v3.6.5.3 bps(IP): 18798336
LSM - SAT 192.168.5.119 DVBS M v3.6.5 bps(IP): 3089896
SAT 2 (S) Test 192.168.6.136 DVBS S v3.6.5.2 bps(IP): 0
ASTRA 11686V22056 192.168.5.125 DVBS M v3.6.5.3 bps(IP): 14814720
ASTRA 11597V22056 192.168.5.127 DVBS S v3.6.5.3 bps(IP): 34869360
ASTRA 11038V22056 192.168.5.145 DVBS S v3.6.5.3 CAS bps(IP): 10876672
ASTRA 12610V22056 192.168.5.128 DVBS M v3.6.5.3 bps(IP): 20397928
ASTRA 12552V22056 192.168.5.129 DVBS S v3.6.5.3 bps(IP): 11747968
ASTRA 11778V27534 192.168.5.130 DVBS S v3.6.5.3 bps(IP): 3765880
HOTB. 11785H27534 192.168.5.131 DVBS M v3.6.7 bps(IP): 16994312
HOTB. 12692H27534 192.168.5.132 DVBS S v3.6.7 bps(IP): 9082976
HOTB. 12360H27534 192.168.5.133 DVBS S v3.6.7 bps(IP): 8242336
NILES 12284V27534 192.168.5.139 DVBS M v3.6.5.3 CAS bps(IP): 0

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The management and configuration of every POLARplus device type is explained in **separated chapters** for an easy review.

One of the last chapters in this document is dedicated to explain the **redundancy management** that POLARplus Manager performs in group of devices. There will be a primary and a secondary group of devices (redundancy **1+1**), and each group consists of different "connected" devices that builds up a transport stream in ASI format. POLARplus Manager monitors the right performance of a group, and in case of fail and depending on the redundancy configuration, will control a ASI switch to select the right ASI output between the primary and secondary groups. This redundancy management is normally applied to DVB-T/H headends operation.

The recommended features for the hardware to run the *POLARplus Manager* are:

- Pentium 4 (2 GHz) and 512 MBytes RAM.
- Ethernet interface.
- 200 MBytes free on hard disk.
- OS installed: Windows 2K/XP and Linux Redhat/Debian.

IMPORTANT: In order to work with the application it is completely necessary to load once a license provided by SIDSA ("**licence.dat**" file located in "SW\POLARplus Manager\Licence" folder on the delivered CD), using the menu option "File/Load Licence". In case, the licence is missing or lost, the licence can be asked to your provider[1] sending the prelicence file generated by the software installation (use the menu option "File/Get Prelicence"). Your provider will reply you with the corresponding licence.

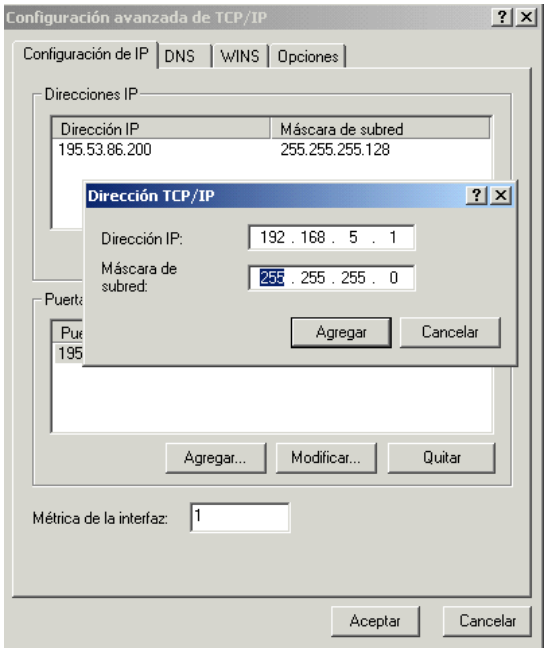
In POLARplus Manager versions before 6.27.12, with the provided licence, you can execute the application **ONLY** on the PC or laptop where you has generated the prelicence. From POLARplus Manager version 6.27.12, the licence is unique, and machine independent, for every customer. Also, it is very important to notice that the provided licence is valid for future SW updates.

The license is generated according to the MAC address of the network interface. If the network interface is disabled the prelicence file will be wrong and also the licence file wont be correctly loaded.

Moreover, in order to connect to a POLARplus device and configure it, it is completely necessary that the host, where you have installed the software application, has an IP address belonging to EtherTV subnet. So, we have to execute ***Start/ Control Panel/ Network Connection/ Local Area Connection/ Properties/***

[1] If your provider is SIDSA, send the prelicence file to SIDSA e-mail ethertvsupport@sidsa.com including the order number associated. SIDSA will reply you with the corresponding licence.

Internet Protocol (TCP/IP)/ Properties/ Advanced Options/ P address/ Add, introducing a free IP address inside POLARplus network.



There is a web page (http://ethertv.sidsa.com), where our customers will be able to download the last versions of firmware, software and the documentation in relation with. In order to access this page the customer must be registered, sending an e-mail to ethertvsupport@sidsa.com indicating who is your provider, in case that there was it. SIDSA will give you a user and password to access this link.

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2 DVB-IP Gateways

POLARplus Manager is an application that allows the **search**, **monitoring** and **configuration** of the POLARplus devices grouped under the category of *DVB-IP Gateways*. Inside this category the following types of devices are found:

- **etherTV - S** **(DVBS)**
- **etherTV - S2** **(DVBS2)**
- **etherTV - T** **(DVBT)**
- **etherTV - C** **(DVBC)**
- **etherTV - ASI** **(DVBA)**
- **etherTV - BIN** **(DVBA)**

The only difference among these types is the input stage of the device: for the three first types, satellite, terrestrial and cable, there is a module tuning/demodulator, different for each type, that treats the input RF signal coming from an antenna or modulator; for the ASI type, this input stage does not exist. All the explanations showed in this chapter apply on all the *DVB-IP Gateways* devices (referred as "devices" in this chapter), except the opposite is explicitly said.

There is an additional hardware version for each of these devices (except DVBA device), named "**Common Interface"** (**CI**) that allows to descramble encrypted services using up to two conditional access modules (CAM) via PCMCIA interface.

For ASI input there are two options ethertTV-ASI and etherTV-BIN. The difference between them is that etherTV-ASI can obtain the SPTS from a MPTS input (demultiplex) and etheTV-BIN not.

Using *POLARplus Manager* on these devices, we will be able to carry out some management tasks, as well as the configuration of the streaming services.

The **management tasks** are:

- Device settings configuration. These settings are the name, network settings, querying status and TTL.
- LNB settings configuration (only in case of DVBS).
- Update of the firmware embedded on the device.
- Reset of the device, keeping its previous configuration.
- Suspend and resume the streaming coming out from the device.

The **configuration** of a device will consist basically in the election of the operation mode as well as of the services or programs that the device will serve to the network in format of "transport stream" encapsulated in IP, utilizing addressing multicast or unicast. These services must be in the same transponder or channel (except in the case of DVBA that makes no sense), because a device, in a given moment, only can tune in a single transponder.

On SPTS mode (see following paragraph), using this tool, we will be able to modify the services configured, changing the direction/port of streaming or adding or removing PIDs. Normally a service will consist of an set of PIDs: a video PID, one or various audio PIDs and perhaps some data PIDs.

There is a new DVB-IP Gateway ***Deluxe*** version with several new features:

- Allow an automatic EIT (Event Information Table) Filtering. Service content information is stored into the EIT. Typically, the electronic program guide or EPG. Using this feature, it is possible to access to that information per service, and then it could be used to generate automatically a new program guide.
- Increase from 8 to 14 the maximum number of SPTS services (see 2.1.1).
- Support BISS decryption (Basic Interoperable Scrambling System) (see 2.4.3.3).
- Include a SNMP agent.

2.1 Operation Modes

The device operation mode refers to the filter type that device applies on the input transport stream, and therefore to the content sent via Ethernet. The device can operate basically in two operation modes, **SPTS** mode (Single Program Transport Stream) and **MPTS** mode (Multiple Program Transport Stream). By default, the device will work on SPTS mode, and the change of mode is carried out by means of the menu options "Configuration/Set MPTS Mode" and "Configuration/Set SPTS Mode".

2.1.1 SPTS Mode

In the SPTS mode (Single Program Transport Stream), the device filters part of the information of the input transport stream. The filtered information is configured in SPTS services (up to eight as maximum or fourteen for *Deluxe* version) and encapsulated in IP according to each service streaming configuration. Normally, the SPTS services present a variable bitrate, and in order to create them, we will start from a list of available services (see paragraph 2.4.2).

2.1.2 MPTS Mode

In the MPTS mode (Multiple Program Transport Stream), the device filters all the information of the input transport stream. All this information is configured in a single service MPTS and encapsulated in IP according to its streaming configuration. Normally, the MPTS service present a constant bitrate, the same as the input transport stream. In this mode the device acts in a transparent way.

In this case, in order to configure the unique service, we will start from a list of available transponders, except in case of DVBA device where the election of transponder makes no sense (see paragraph 2.4.2).

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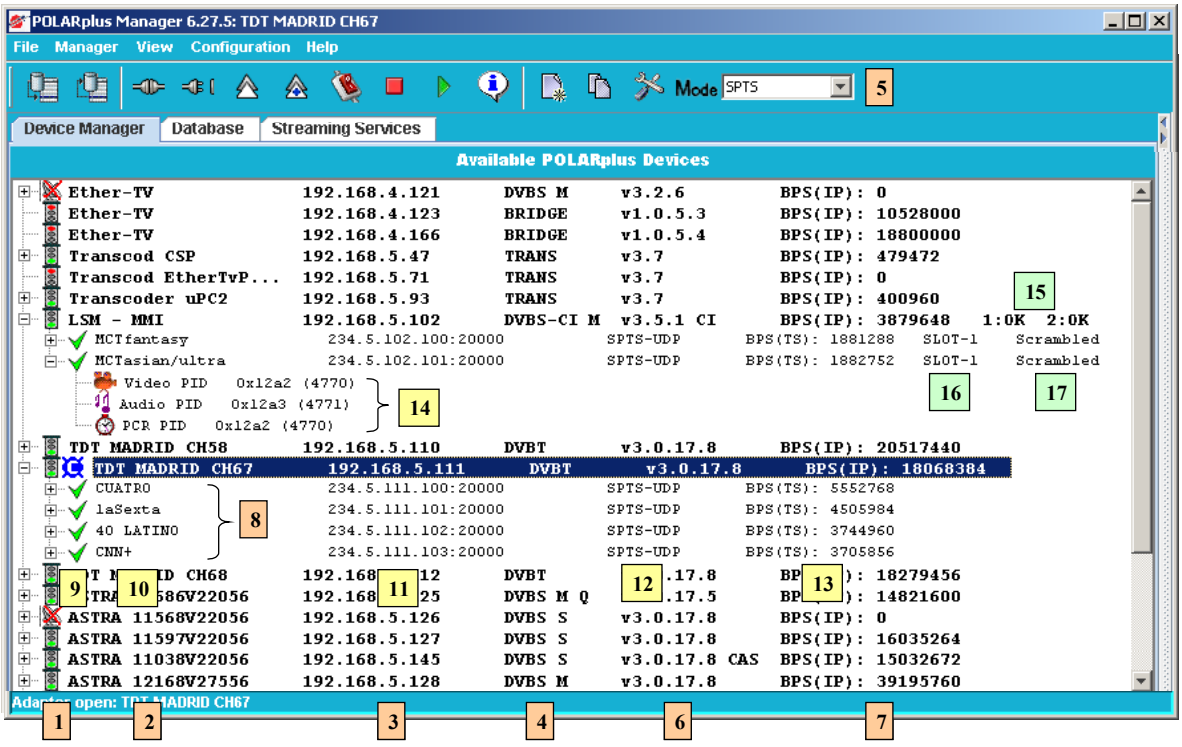
2.2 Searching devices

The search for the *DVB-IP Gateways* existing in the local network is automatic. The application continuously shows an updated list of devices in the local network, indicating their status. The *DVB-IP Gateways* devices present the text **DVBS**, **DVBS2, DVBT**, **DVBC** or **DVBA** next to IP address. In case of devices that incorporate the hardware option “Common Interface” the text include the suffix **–CI**.

This information is presented in “Device Manager” tab, and can be seen in the following figure.


POLARplus Manager 6.27.5: TDT MADRID CH67
File Manager View Configuration Help
Mode SPTS
5
Device Manager
Database
Streaming Services
Available POLARplus Devices
Ether-TV 192.168.4.121 DVBS M v3.2.6 BPS(IP): 0
Ether-TV 192.168.4.123 BRIDGE v1.0.5.3 BPS(IP): 10528000
Ether-TV 192.168.4.166 BRIDGE v1.0.5.4 BPS(IP): 18800000
Transcod CSP 192.168.5.47 TRANS v3.7 BPS(IP): 479472
Transcod EtherTvP... 192.168.5.71 TRANS v3.7 BPS(IP): 0
Transcoder uPC2 192.168.5.93 TRANS v3.7 BPS(IP): 400960
LSM - MMI 192.168.5.102 DVBS-CI M v3.5.1 CI BPS(IP): 3879648 1:OK 2:OK
MCTfantasy 234.5.102.100:20000 SPTS-UDP BPS(TS): 1881288 SLOT-1 Scrambled
MCTasian/ultra 234.5.102.101:20000 SPTS-UDP BPS(TS): 1882752 SLOT-1 Scrambled
Video PID 0x12a2 (4770)
Audio PID 0x12a3 (4771)
PCR PID 0x12a2 (4770)
14
15
16
17
TDT MADRID CH58 192.168.5.110 DVBT v3.0.17.8 BPS(IP): 20517440
TDT MADRID CH67 192.168.5.111 DVBT v3.0.17.8 BPS(IP): 18068384
CUATRO 234.5.111.100:20000 SPTS-UDP BPS(TS): 5552768
laSexta 234.5.111.101:20000 SPTS-UDP BPS(TS): 4505984
40 LATINO 234.5.111.102:20000 SPTS-UDP BPS(TS): 3744960
CNN+ 234.5.111.103:20000 SPTS-UDP BPS(TS): 3705856
8
ASTRA 11568V22056 192.168.5.126 DVBS S v3.0.17.8 BPS(IP): 0
ASTRA 11597V22056 192.168.5.127 DVBS S v3.0.17.8 BPS(IP): 16035264
ASTRA 11038V22056 192.168.5.145 DVBS S v3.0.17.8 CAS BPS(IP): 15032672
ASTRA 12168V27556 192.168.5.128 DVBS M v3.0.17.8 BPS(IP): 39195760
1
2
3
4
6
7

The information showed for every device is the following:

(1) Device Status. The meaning of the possible values are:

- Green light: the device is streaming out at least one service.
- Red light: the device is not streaming out any service.
- Crossed antenna: the device is not tuned, either it has not been previously tuned, or is not receiving RF signal from the antenna/modulator.
- Yellow light: temporary status, in which the device is initializing.
- No symbol (Board OFF): the device becomes not present (temporal status).
- Question mark: the device has been manually connected.

(2) Device Name.

(3) Device IP address.

(4) POLARplus device type that in case of *DVB-IP Gateways* devices can be the following values:

- **DVBS or DVBS2**: satellite etherTV.
- **DVBT**: terrestrial etherTV.
- **DVBC**: cable etherTV.
- **DVBA**: ASI etherTV.

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In case of devices that incorporate the hardware option “Common Interface” the type value include the suffix **–CI**. Also in DVBS case, the power supply state regarding antenna LNB is presented by means of **M** (MASTER) or **S** (SLAVE). Finally in this column, we can check if the device querying is activated by means of **Q.**

(5) Operation Mode: **SPTS** or **MPTS** mode. In order to notice this information, the device must be connected.

(6) Firmware version embedded on device.

(7) Bitrate (Bits/second) coming out from device, including the ethernet, IP, … headers.

(8) List of streaming services configured in device.

The following information is showed for every streaming service (extended information):

(9) The service status. The meaning for the possible values is:

- Green tick: the service is configured as running and it is being streamed out.
- Yellow tick: the service is configured as running but it is not being streamed out, because the device is suspended or is not receiving input signal or this signal is not right.
- Red cross: the service is configured as stopped.

(10) The name of the streaming service.

(11) The multicast/unicast address and port number associated with the streaming service.

(12) The streaming mode: SPTS-UDP, SPTS-RTP, MPTS-UDP, MPTS-RTP or MPE (only in SPTS mode).

(13) Bitrate (Bits/second) related with the streaming service. The measure is only about transport stream.

(14) PIDs list associated to the service (extended information). Only video, audio and PCR PIDs are showed.

In case of devices that incorporate the hardware option “Common Interface”, we can see additional information for the device and associated services (see paragraph 2.3.7):

(15) Status of the two “Common Interface” *slots* associated to device. This status can be one of the following ones:

- **OK** : the conditional access module (CAM) is present, initialised and ready to be used.
- **I?** : the conditional access module (CAM) is present, is either initialising or in a state not ready to be used.
- **-** : the conditional access module is not present.

(16) *Slots* associated to the service. Every service can be associated to one, two or none *slot*.

(17) Scrambling status of the incoming service: it can be **Scrambled** or **Free**.

We can obtain more information about a given device selecting it with the mouse and using the right button to execute ‘**More Info**’ or clicking the icon . The additional information is in relation with the firmware version embedded on device, with the tuned transponder, reception quality, BER, power, and/or with CI *slots* status (in case of CI hardware option).

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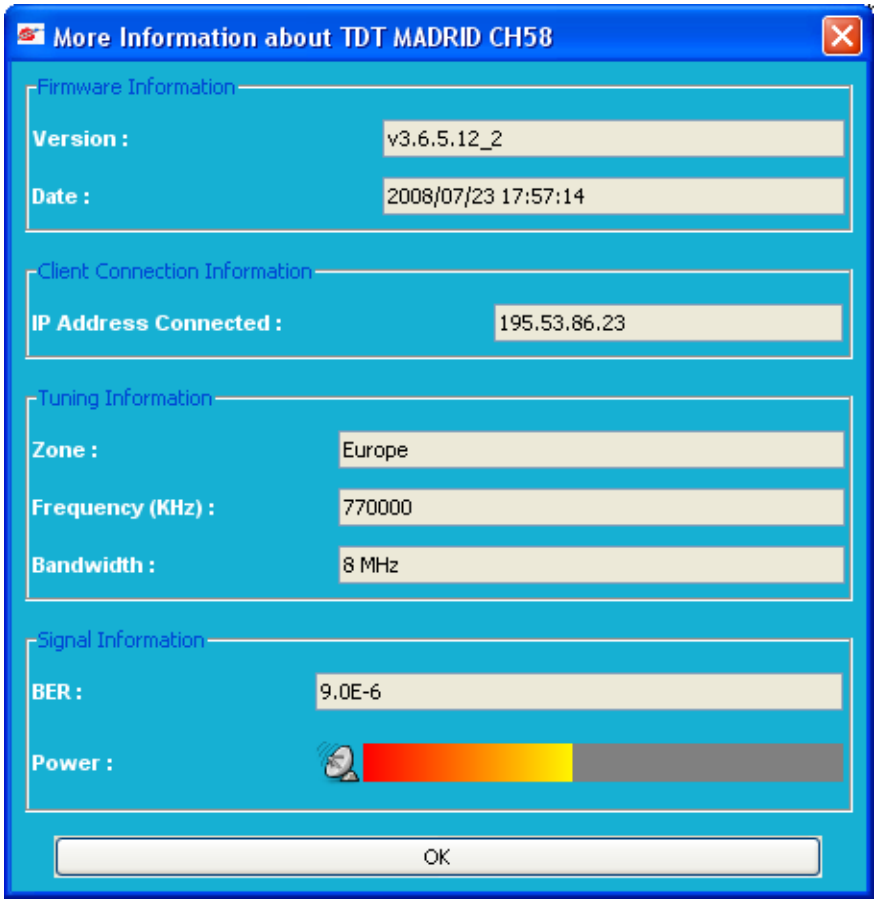

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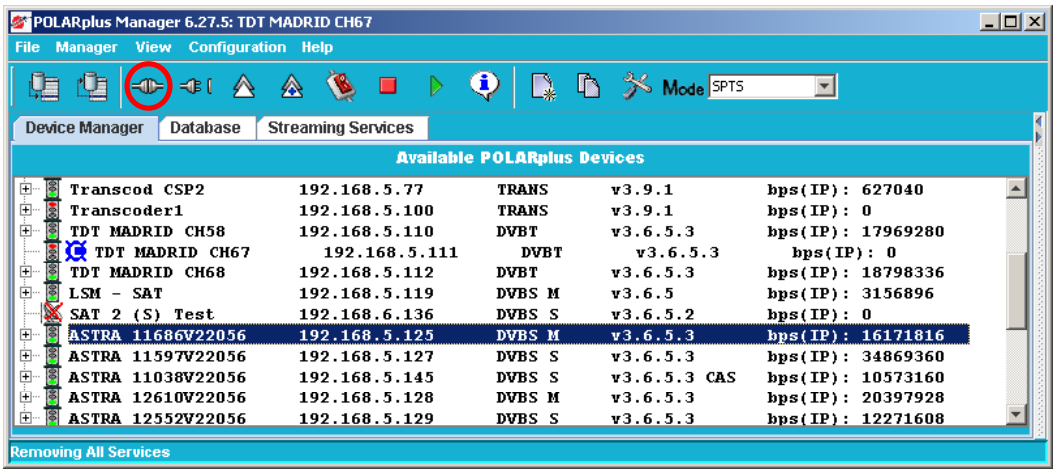
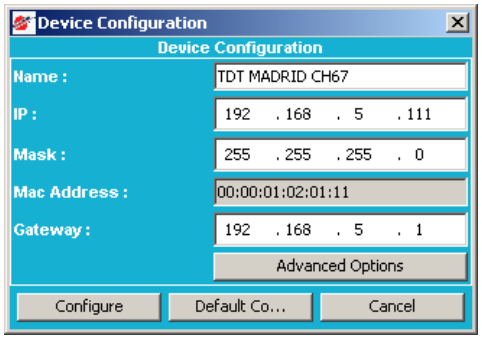
2.3 Management Tasks

The management commands are applied to the **selected** device (highlighted line), but not the "Set MPTS/SPTS Mode", "Device Settings" and "LNB Settings" commands that are applied to the device **"connected"** (symbol **"C"**). In the following figure you can see that the selected device, and the device connected can be different ones. A selected device is done by a simple click on the desired device, and a device connected can be by three different ways: doing a double click on the device, or selecting the device (simple click) and either clicking the 'Connect' icon ( ) or doing the menu option "Manager/Connect".


POLARplus Manager 6.27.5: TDT MADRID CH67
File Manager View Configuration Help
Mode SPTS
Device Manager Database Streaming Services
Available POLARplus Devices
Transcod CSP2 192.168.5.77 TRANS v3.9.1 bps(IP): 627040
Transcoder1 192.168.5.100 TRANS v3.9.1 bps(IP): 0
TDT MADRID CH58 192.168.5.110 DVBT v3.6.5.3 bps(IP): 17969280
TDT MADRID CH67 192.168.5.111 DVBT v3.6.5.3 bps(IP): 0
TDT MADRID CH68 192.168.5.112 DVBT v3.6.5.3 bps(IP): 18798336
LSM - SAT 192.168.5.119 DVBS M v3.6.5 bps(IP): 3156896
SAT 2 (S) Test 192.168.6.136 DVBS S v3.6.5.2 bps(IP): 0
ASTRA 11686V22056 192.168.5.125 DVBS M v3.6.5.3 bps(IP): 16171816
ASTRA 11597V22056 192.168.5.127 DVBS S v3.6.5.3 bps(IP): 34869360
ASTRA 11038V22056 192.168.5.145 DVBS S v3.6.5.3 CAS bps(IP): 10573160
ASTRA 12610V22056 192.168.5.128 DVBS M v3.6.5.3 bps(IP): 20397928
ASTRA 12552V22056 192.168.5.129 DVBS S v3.6.5.3 bps(IP): 12271608
Removing All Services

2.3.1 Configuration of the device parameters

We can configure the device parameters by clicking the menu option "Configuration/Device Settings" or clicking the icon . These parameters are: name (the default value is "Ether-TV"), network settings (IP address, net mask and gateway address), "querying" status and TTL value. These two last parameters are inside "Advanced Options".


Device Configuration
Device Configuration
Name : TDT MADRID CH67
IP : 192 . 168 . 5 . 111
Mask : 255 . 255 . 255 . 0
Mac Address : 00:00:01:02:01:11
Gateway : 192 . 168 . 5 . 1
Advanced Options
Configure
Default Co...
Cancel

The "querying" status parameter is in relation with the multicasting management. Normally, the multicast traffic generated by these devices is distributed through routers and switches that must support IGMPv2. In these distribution networks there must be a "querier" that generates 'IGMP query' messages. This function is generally made by a router/switch, but if it is not present you can configure an only one device to perform this function. The port of the switch or router where this "querying" device is attached to, must support all the multicasting traffic existing in this switch/router. The "querying" status of the device can be displayed and modified in "Enable Querier" tick.

The TTL parameter value refers to the value of "Time To Live" field, in the streaming traffic generated from the device. When an IP packet comes in a router/switch, if its TTL is non zero, the packet will be propagated with the TTL decremented by 1. So, this value gives us an idea of the scope for the streaming traffic generated by these devices. The "querying" status and TTL value is configured through the following window.

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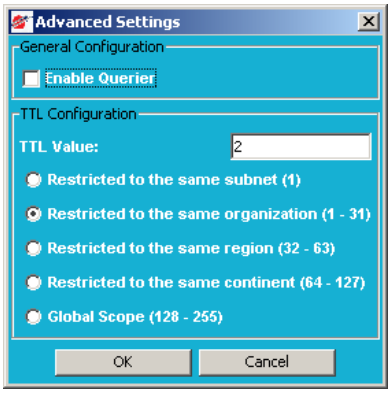
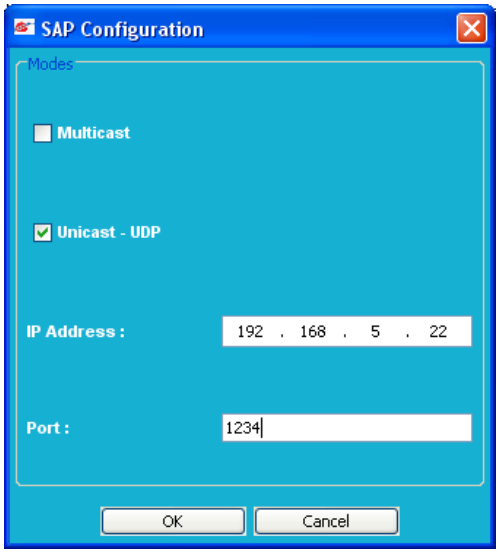


2.3.2 SAP Configuration

In some cases multicast is not enabled in management networks . However it is possible to see status in Polarplus Manager configuring the announce protocol (SAP) on Unicast address:



The main limitation of this mode is that only one manager is possible.

2.3.3 Configuration of the LNB parameters (DVBS and DVBS2)

This configuration only applies to **DVBS/DVBS2 devices** and is in relation with the power supply features that the device provides to the antenna LNB. These features determine the transponders that the device can tune: they establish the possible band and polarization for the tuned transponders.

These parameters with their default values are presented in the following figure.

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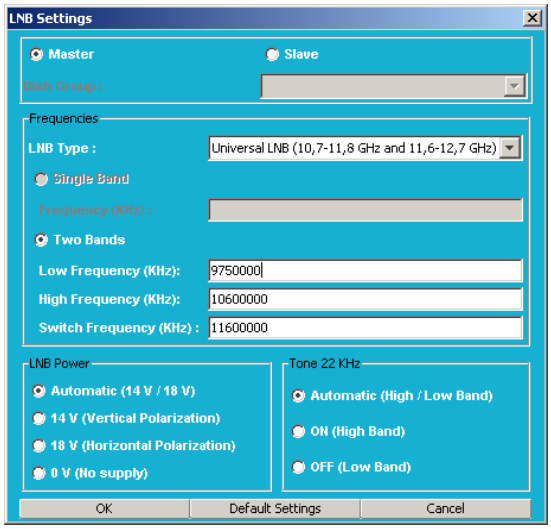

Firstly, the device can be configured as MASTER supplying LNB (DVBS/S2 M), or as SLAVE not supplying LNB (DVBS/S2 S). The antenna LNB has to be supplied, so if there are some devices plugged to the same LNB, only one has to be configured as MASTER and supply the LNB. The rest of the boards has to be configured as SLAVE associated with the MASTER (we select the MASTER IP address in the "Dish Group" box).

In case of MASTER device, we have to select the LNB type that we are using. For an universal LNB, we present the following parameters and their default values:

- LNB Low Frequency (MHz) = 9,750 (local oscillator for lower band)
- LNB High Frequency (MHz) = 10,600 (local oscillator for higher band)
- LNB Switch Frequency (MHz) = 11,600

If we are using a different LNB type, the important data to know about it is the number of the local oscillators (single or double band), and the value of its local oscillators.

The tuner of the device presents a frequency range 0.95-2.15 GHz and using an universal LNB, the Ku band (10.7 – 12.75 GHz) is completely covered:

- Low Band: 10.70 - 11.9 GHz (9.75+0.95) - (9.75+2.15)
- High Band: 11.55 - 12.75 GHz (10.6+0.95) - (10.6+2.15)

The parameter "LNB Switch Frequency" fixes the limit between using the lower or higher local oscillator of the LNB.

Finally, when the device is MASTER, we can force the characteristics of the power supply to LNB (level and tone). We recommend you to keep these parameters in automatic: the level and tone values are set according the polarization and sub-band of the transponder you are tuning at every moment.

2.3.4 Firmware Update

The *POLARplus Manager* presents the option to update the firmware embedded in the selected device or in all devices existing in the local segment, by clicking the menu options "Manager/Upload" and "Manager/Upload ALL" (and respectively in the icon bar). In both cases, a dialog window comes up, inviting you to introduce the binary file to upload. Once the firmware update is finished, the device will be restarted.

2.3.5 Initialization

The menu option "Manager/Reset" allows initializing the selected device, leaving intact the current configuration including the streaming services previously configured.

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2.3.6 Suspend and Resume

The menu options “Manager/Suspend”, “Manager/Resume”, “Manager/Suspend ALL”, and “Manager/Resume ALL”, allow suspending or resuming the selected device or all existing devices in the local network (and respectively in the icon bar).

The device suspension implies that the device stops the streaming of all its running services. As a consequence of suspension, the traffic light of the device will change to red and the green ticks of the running services to yellow. In the same way, in “Streaming Services” tab, the green color of the running services will change to yellow.

When we resume the device, the previously suspended services will return to be streamed out. These services will return to green.

A device initialization caused by either a hardware reset or a command from the application (Upload and Reset), implies a resume of the all suspended services.

2.3.7 Management of the *slots* “Common Interface” (-CI)

When a device with the option hardware CI is connected, there is a new menu in the application: **"CI Manager"**. By means of this new menu, we will be able to obtain information about conditional access modules (CAM) inserted in the slots, and carry out operations on them, as reset and power off. Also, we will be able to enter the proprietary menus of the CAM inserted.

2.3.8 Events Logging

There are two buttons (arrows) in the right border of the main window in order to maximize or minimize the logging window. This window contains a registration of all the events related to any change of the status in the devices or its associated services. Besides, it includes a registration of the commands executed from menu option “Manager”.

2.3.9 SNMP Management

The new DVB-IP Gateway ***Deluxe*** version include a SNMP agent, that allow these boards to be managed using a SNMP Manager, by including them as managed elements in a SNMP Network. The Management Information Base (MIB) is provided in the file “ethertv-mib.mib”, in the CD included in the order. If you need it and cannot find it, contact polarissupport@SIDSA.com.

With this MIB and an SNMP manager you have the possibility to monitor the DVB-IP Deluxe Gateways status (by SNMP traps). There are various SNMP management tools available to issue SNMP based commands to the appliance (Software not supplied by SIDSA).

SIDSA proposes to use the MIB Browser by iReasoning to monitor DVB-IP Deluxe Gateways. iReasoning offers a free version of the MIB Browser under www.ireasoning.com, which is useful to read the actual status or setting up the variables. See below for further information.

SNMP uses the following standard ports: Port 161 and port 162

- Port 161 is used by the SNMP manager and the agent to send the Requests and their Responses.
- Port 162 is used by the SNMP agent to send TRAPs to the SNMP manager.

Make sure that these ports are not blocked in your network.

The following operations are possible with SNMP

GET	Read out the management information
GETNEXT	Read out the management information iteratively, which is useful if you want to read the information down the MIB tree step by step
GETBULK	Read out the management information of the complete list/tree
SET	Change/set the management information
TRAP	Start the Trap receiver in your SNMP manager to get alerts of the managed system.

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SNMP Variables:

- **etherTVTrapSink**: this variable defines the IP address used to send traps generated by the agent.
- **etherTVglobalTrapEnable**: it allows enabling or disabling all the traps issued by the agent. (‘1’ = enabled, ‘2’ = disabled). This is the first variable to set, and it should have the IP address of the PC where the SNMP Manager (Trap Receiver) is installed, or the PC where the MIB Browser is running.
- **etherTVtrapEnableColdstart**: it allows enabling or disabling the ColdStart trap generation.
- **etherTVtrapEnableHeartbeat**: it allows enabling or disabling the HeartBeat trap generation according to the etherTVHeartbeatFreq value. (‘1’ = enabled, ‘2’ = disabled).
- **etherTVtrapEnableSignalLoss**: it allows enabling or disabling the SignalLoss trap generation according to the etherTVTrapSignalLossTHD value. (‘1’ = enabled, ‘2’ = disabled).
- **etherTVtrapEnableLowBitRate**: it allows enabling or disabling the LowBitRate trap generation according to the etherTVtrapLowBitRateTHD value. (‘1’ = enabled, ‘2’ = disabled).
- **etherTVtrapEnableBoardStatusChange**: it allows enabling or disabling the BoardStatusChange trap generation. (‘1’ = enabled, ‘2’ = disabled).
- **etherTVtrapHeartbeatFreq**: it determines the repetition period of the HeartBeat trap in seconds when etherTVtrapEnableHeartBeat has the ‘enabled’ value.
- **etherTVtrapRepeatFreq**: it determines the repetition period of all the traps, except the HeartBeat trap, when etherTVtrapRepeatEnable has the ‘enabled’ value.
- **etherTVtrapSignalLossTHD**: it is the signal loss threshold value. If RF signal value falls below this value, a SignalLoss trap is issued if it is enabled.
- **etherTVtrapLowBitRateTHD**: it is the low bit rate threshold value. If streaming bitrate falls below this value, a LowBitRate trap is issued if it is enabled.
- **etherTVHeartBeat**: it notifies that the EtherTV device is alive.
- **etherTVSignalLoss**: it is issued when the RF signal is low, according to the threshold value set in the etherTVtrapSignalLossTHD variable.
- **etherTVSignalOK**: it is issued when the RF signal gets back a value greater than the etherTVtrapSignalLossTHD variable**.**
- **etherTVLowBitrate**: it is issued when the bitrate of a streaming service is low, according to the threshold value set in the etherTVtrapLowBitRateTHD variable.
- **etherTVBitrateOK**: it is issued when the bitrate of a streaming service gets back to a value greater than the etherTVtrapLowBitRateTHD variable.
- **etherTVBoardStatusChange**: it is issued when a board changes its status (tuned, not-tuned, wait, off, ...).
- **ColdStart**: it is issued when a device is reinitializing itself and its configuration may have been altered.

Below you can find a short overview of the MIB Browser by iReasoning, to show the basic points of using SNMP.

1) Install the MIB Browser and launch it.

2)Load the MIB file.

Click on File > Load MIBs and choose the folder with the MIB file “ethertv-mib.mib”.

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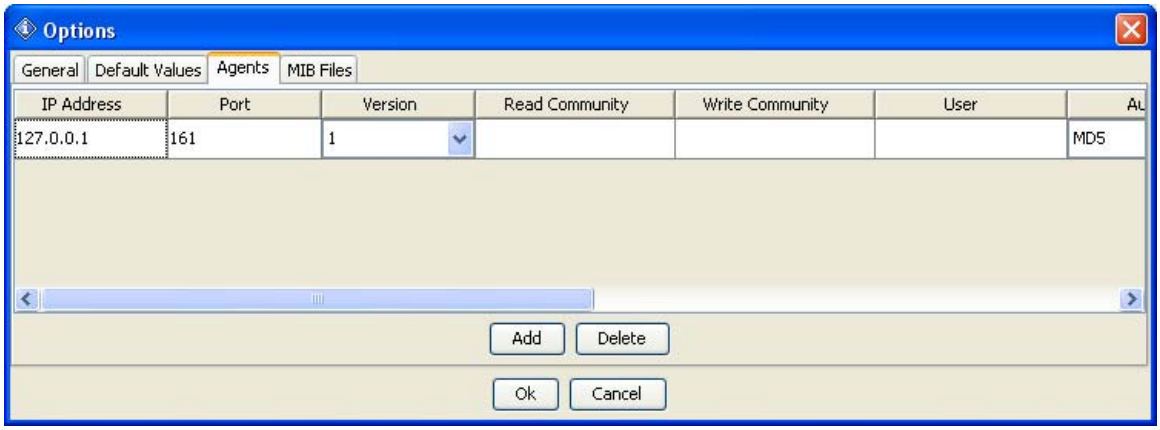
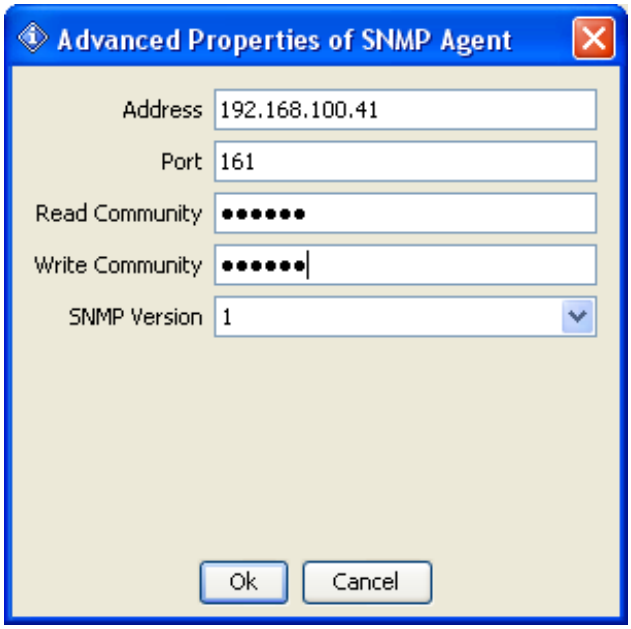
3) Set up the agent

Click on Tools > Options and choose “Agents”



Click on “Add” and the following window will open to add an SNMP device



Adress: Type in the IP address of the SNMP agent, in this case the DVB-IP Deluxe Gateway.

Port: The default port used is 161, change it if you are using another one in your SNMP Network.

Read and Write Community: for SIDSA agent, **public** is used for both Read and Write Community.

Press Ok to save the Agent properties.

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Add more agents if necessary (there should be so many agents as DVB-Ip Deluxe Gateways in the SNMP Network). When finished, press Ok.

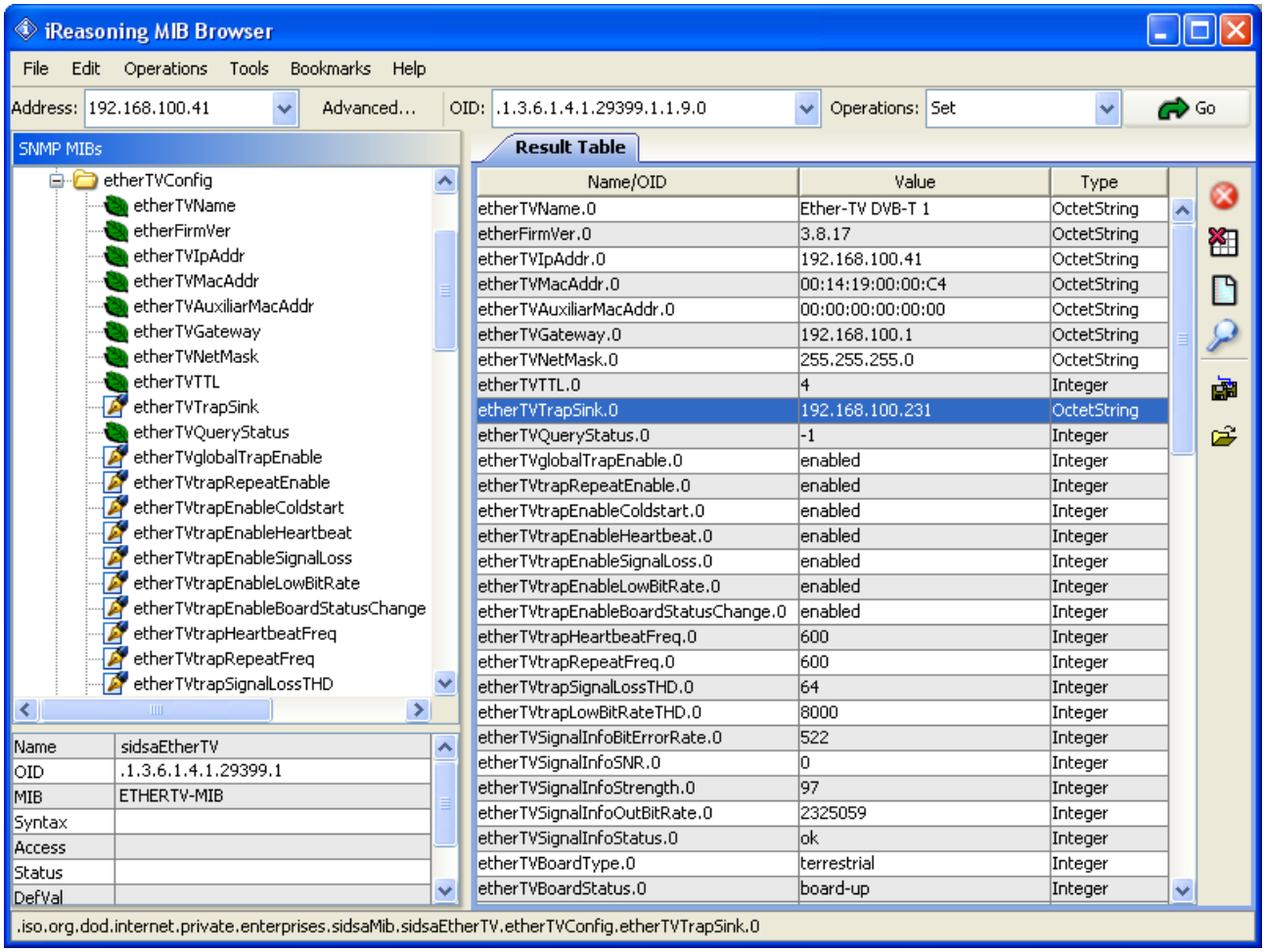
On MIB Browser main window, choose the ETHER TV-MIB and right click on it. Click on “Expand subtree” to see all the variables.

Select the agent of the DVB-IP Deluxe Gateway in the field Address.

The common operations of the MIB Browser are:

Get	Read out the management information
Get Next	Read out the management information iteratively, which is useful if you want to read the information down the MIB tree step by step
Get Subtree	Read out the management information of the selected subtree
Walk (Getbulk)	Read out the management information of the complete list/tree
Set	Change/set the management information

You can use the operation “Walk” to read all the variables from the selected agent.



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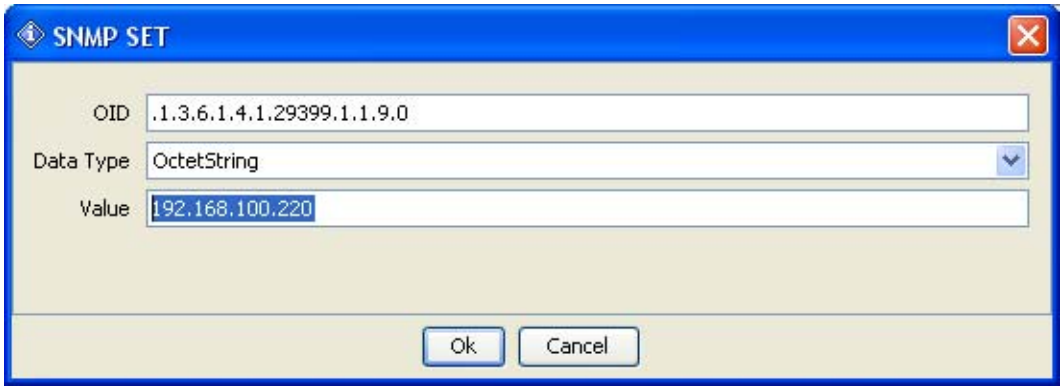
Then we can select, e.g. the variable (aka OID) “etherTVTrapSink” and execute the operation Set to set the correct value.



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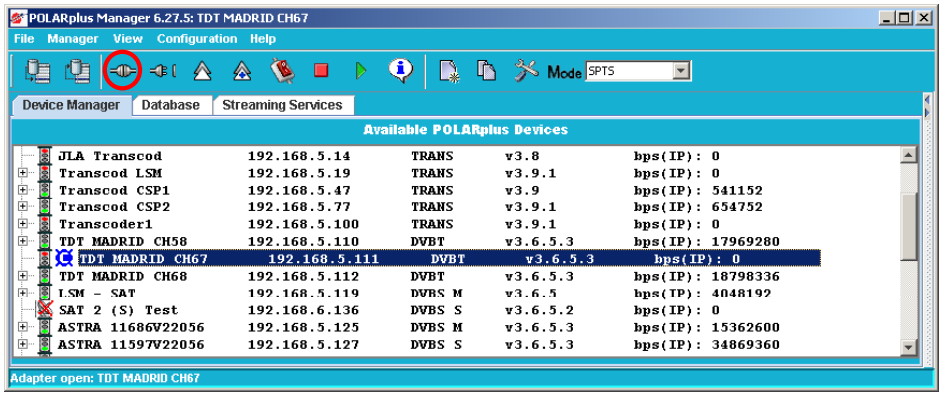
2.4 Configuration

Firstly, we have to check that device is operating on the desired mode (see paragraph 2.1). In order to change the operation mode, we should execute the corresponding menu option “Configuration/Set xxx Mode”. When we change the operation mode, the previous service configuration is deleted.

Once the operation mode is selected, the configuration of a DVB-IP Gateway device will consist in the following steps:

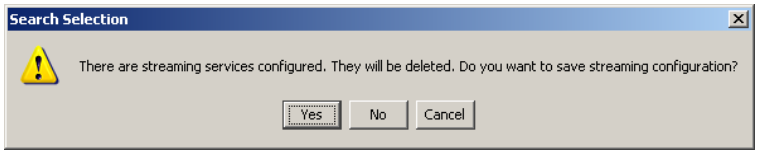
- Search for the available services/transponders that the device receives.
- Definition of the streaming services.
- Start and stop the streaming services.

In order to configure a device, firstly we must **connect** to it. We remind you that a board connected is set up by three different ways: doing a double click on the device, or selecting the device (simple click) and either clicking the ‘Connect’ icon or doing the menu option “Manager/Connect”.


POLARplus Manager 6.27.5: TDT MADRID CH67
File Manager View Configuration Help
Mode SPTS
Device Manager Database Streaming Services
Available POLARplus Devices
JLA Transcod 192.168.5.14 TRANS v3.8 bps(IP): 0
Transcod LSM 192.168.5.19 TRANS v3.9.1 bps(IP): 0
Transcod CSP1 192.168.5.47 TRANS v3.9 bps(IP): 541152
Transcod CSP2 192.168.5.77 TRANS v3.9.1 bps(IP): 654752
Transcoder1 192.168.5.100 TRANS v3.9.1 bps(IP): 0
TDT MADRID CH58 192.168.5.110 DVBT v3.6.5.3 bps(IP): 17969280
TDT MADRID CH67 192.168.5.111 DVBT v3.6.5.3 bps(IP): 0
TDT MADRID CH68 192.168.5.112 DVBT v3.6.5.3 bps(IP): 18798336
LSM - SAT 192.168.5.119 DVBS M v3.6.5 bps(IP): 4048192
SAT 2 (S) Test 192.168.6.136 DVBS S v3.6.5.2 bps(IP): 0
ASTRA 11686V22056 192.168.5.125 DVBS M v3.6.5.3 bps(IP): 15362600
ASTRA 11597V22056 192.168.5.127 DVBS S v3.6.5.3 bps(IP): 34869360
Adapter open: TDT MADRID CH67

We can configure a device which is not listed (the application couldn’t detect it), if we know that it is available (check by a **ping** to the IP address using a command console) and we know its IP address. We have to click in the menu option “Manager/Manual connection”. If the application achieves to connect the device, this will be added to the list with an unknown state (?).

Whatever operation that implies a deletion of the configured services in the device, as is a change in the operation mode or in the tuning/demodulating parameters, the application warns and invites us to save the previous configuration in a file for its subsequent recovery (see 2.4.3).


Search Selection
There are streaming services configured. They will be deleted. Do you want to save streaming configuration?
Yes
No
Cancel

Before analyzing the search and configuration of services, we are going to see a summary of the different options in the streaming mode. We analyze further the cautions to follow in order to configure DVBS devices in case they are sharing LNB. Finally, we will see the features in the configuration of devices that include the hardware option "Common Interface".

2.4.1 Streaming Mode

The streaming mode of a service refers to the content and encapsulation protocol over what is sent via ethernet related to the service, and it is depending on the device operation mode:

⇒ In SPTS mode, there are two possibilities:

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- **Transport Stream**: The transport stream related to the configured PIDs for the service is encapsulated in IP using UDP or RTP protocols and unicast or multicast addressing. In this case, the device generates and sends the service information tables (PAT, PMT y SDT).
- **MultiProtocol IP** (**MPE**): The device sends via ethernet the IP packets included in special sections MPEG (encapsulated in TS) that are transmitted in DVB. Using this streaming mode, the device can filter the IP packets corresponding to the configured **multicast IP address**, inside the MPEG section related to the configured **PID** (only a PID per service). If "Uses IP to MAC mapping" tick is marked, the device will filter all IP packets corresponding to the first 'x' bytes (less meaning) of the MAC address (using multicast to MAC mapping), associated to the configured PID. If this tick is not marked, the device will extract all IP packets corresponding to the configured PID.

⇒ In MPTS mode, the filtered information can be encapsulated in IP using UDP or RTP protocols and unicast or multicast addressing. In this case, the device doesn't generate any service information table.

2.4.2 Search for the available services/frequencies

This step is not necessary if the services or transponders to configure are already in the "**Database**" in the SPTS or MPTS mode respectively, or they are previously saved into a configuration file. If they are not, we have to make a previous search.

Independently the operation mode, we always refer to a services search, although depending on the operation mode, the "Database" tab will show the list of available services (SPTS mode), or a list of available transponders (MPTS mode).

The search in DVBS, DVBS2, DVBT and DVBC devices can be done in two different ways: **manual** ( ) or **automatic** ( ). For DVBT devices, the available transponders depend on the zone where we are; for DVBC devices the available services depend on the cable operator, and for DVBS devices depend on the satellite where the antenna is oriented. The data of all available transponders for every satellite are updated in the web page www.lyngsat.com. We are interested in the satellites that broadcast DVB services. Obviously, we can only tune the transponders associated to the satellite that our antenna is pointing to.

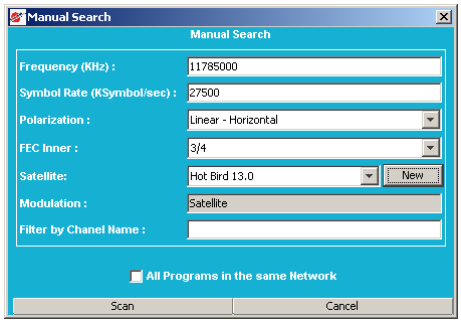
Whatever search in a transcoder or frequency different to the currently tuned, will cause a deletion of the configured services, in case they were. The application will warn and invite us to save this configuration before being deleted.

IMPORTANT: The search in **DVBA** devices is only automatic and is simpler than in the other types of devices because it doesn't have any parameter. This search doesn't imply any modification in the currently configured services.

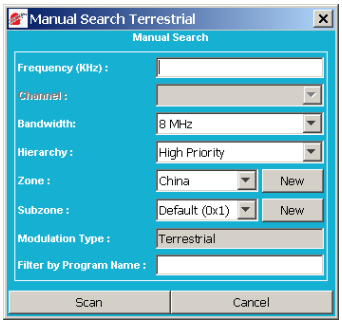
Any kind of search will result in a list of available services/transponders (see paragraph 2.4.2.3).

2.4.2.1 Manual search in DVBS, DVBS2, DVBT and DVBC devices

The manual search allows the search of services included in a given transponder or channel. In order to search we have to execute the menu option "Search/Manual Search", having selected the "Database" tab. It comes up one of the following windows depending on the device type is being used:



DVBS



DVBT

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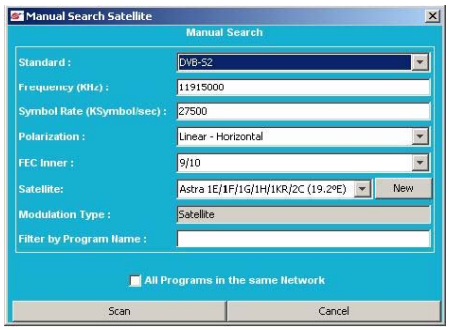
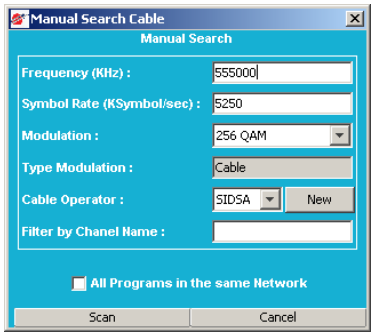


DVBS2



DVBC

Through these windows, we introduce the parameters related to the tune/demodulating of the desired transponder:

- DVBS: frequency, symbol rate, polarization and FEC.
- DVBS2: frequency, symbol rate, polarization and FEC and DBVS or DVBS2 modulation selection.
- DVBT: frequency or channel, bandwidth, hierarchy and zone.
- DVBC: frequency, symbol rate and constellation.

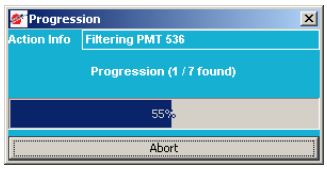
The rest of parameters, satellite for DVBS/DVBS2, subzone for DVBT and cable operator for DVBC, are simply used to classify and store properly the search results (services/frequencies). We can add, modify or delete these elements using the corresponding “Services” menu option.

Once the search parameters are introduced and we click the “Scan” button, the application starts to search for the available services in the selected frequency.

If we want to search for a given service, we also have to introduce its name in the “Filter by Channel Name” box.

If we tick “All programs in the same Network” for transponder case, the application will search for in all transponders associated to the same network. This action is equivalent to do an automatic search in a given network (see paragraph 2.4.2.2).

During the services search, the application shows up the process state by the following window:



If we click on “Abort” button, the search is cancelled and the services/frequencies found at this moment, are shown up. Once the search is finished, the resulting services/frequencies are highlighted in the “Database”.

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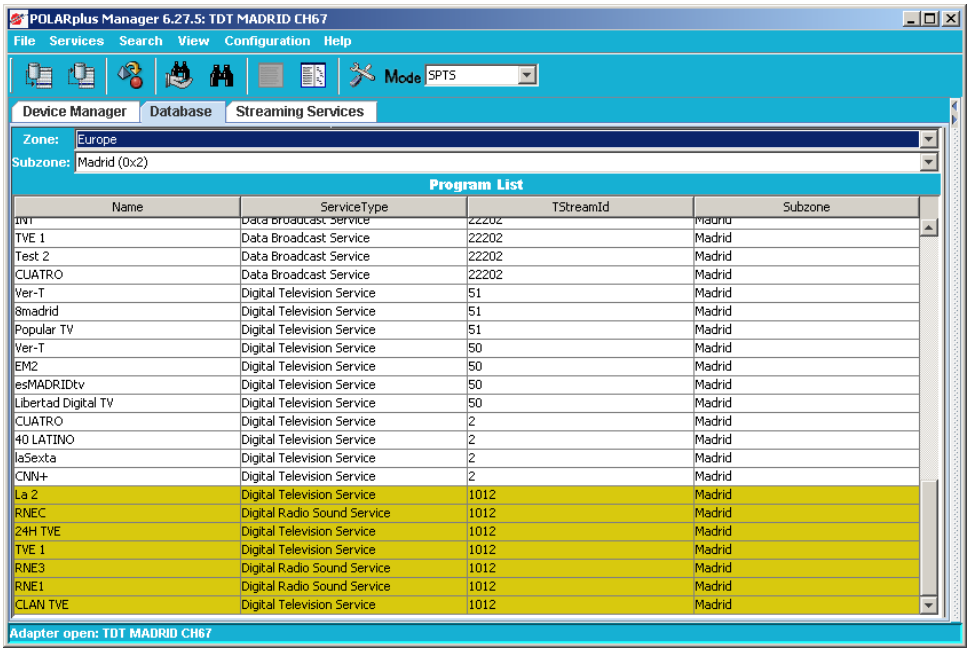
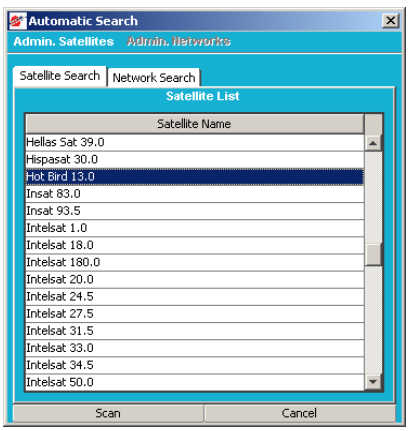

POLARplus Manager 6.27.5: TDT MADRID CH67
File Services Search View Configuration Help
Mode SPTS
Device Manager Database Streaming Services
Zone: Europe
Subzone: Madrid (0x2)
Program List
Name ServiceType TStreamId Subzone
TVE 1 Data Broadcast Service 22202 Madrid
Test 2 Data Broadcast Service 22202 Madrid
CUATRO Data Broadcast Service 22202 Madrid
Ver-T Digital Television Service 51 Madrid
8madrid Digital Television Service 51 Madrid
Popular TV Digital Television Service 51 Madrid
Ver-T Digital Television Service 50 Madrid
EM2 Digital Television Service 50 Madrid
esMADRIDtv Digital Television Service 50 Madrid
Libertad Digital TV Digital Television Service 50 Madrid
CUATRO Digital Television Service 2 Madrid
40 LATINO Digital Television Service 2 Madrid
laSexta Digital Television Service 2 Madrid
CNN+ Digital Television Service 2 Madrid
La 2 Digital Television Service 1012 Madrid
RNEC Digital Radio Sound Service 1012 Madrid
24H TVE Digital Television Service 1012 Madrid
TVE 1 Digital Television Service 1012 Madrid
RNE3 Digital Radio Sound Service 1012 Madrid
RNE1 Digital Radio Sound Service 1012 Madrid
CLAN TVE Digital Television Service 1012 Madrid
Adapter open: TDT MADRID CH67

2.4.2.2 Automatic search in DVBS, DVBS2, DVBT and DVBC devices

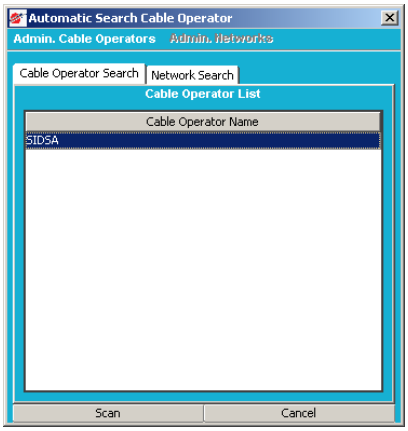
The automatic search allows the search of all services included in the input signal. In order to search we have to execute the menu option “Search/Automatic Search”, having selected the “Database” tab. As in the manual search, to execute the command implies the deletion of a previous services configuration in the device, and the application will warn you. Depending on the device type:

a) Automatic search in DVBS, DVBS2 and DVBC devices

The application shows the following window that invites you to introduce the satellite or the cable operator in which the search results are going to be saved.



DVBS/DVBS2



DVBC

Selecting a satellite/cable operator and clicking the “Scan” button, the application will start the search for every service included in all frequencies related to the satellite/operator, and in all frequencies included in the network information (NIT) of the previous ones. The results are presented in the same way as in the manual search case.

In order to see the frequencies related to a satellite/operator, we make a double click on the satellite/operator, or either “Admin. Satellites/Modify Satellite” or “Admin. Cable Operators/Modify Cable Operator” menu options are executed.

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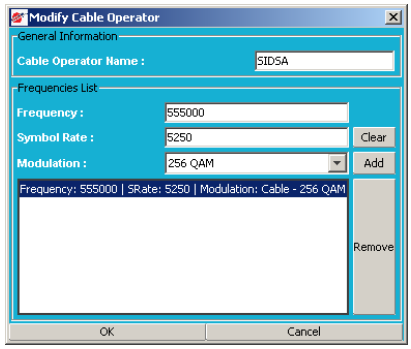
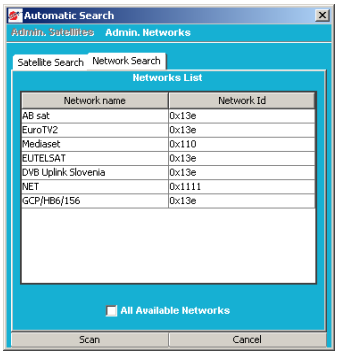
DVBS/DVBS2



DVBC

This list includes all previously scanned frequencies for the satellite/operator. In case of DVBS and DVBS2, if there wasn't any previous search for a satellite, the frequencies list is empty, but we can load a default frequency list by clicking "Load Default Information" button. As many transponders we have in the list, the automatic search result will be more. In this window we can edit new or existing transponders, and add or delete it in the list associated to the satellite.

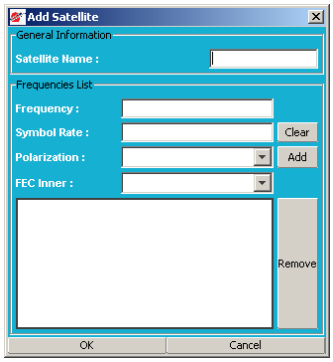
In the tab "Network Search" of "Automatic Search", we find a list of all networks for the selected satellite/operator, which were previously found.



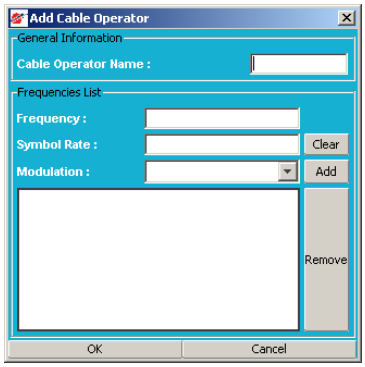
DVBS/DVBS2

Selecting a network, and clicking "Scan", the application starts the search for every services belonging to this network. If we tick the option "All Available Networks", the search will be done for all available networks for the satellite/operator. This action is equivalent to do an automatic search for the satellite/operator.

If you want to search for a satellite/operator that is not in the list, you can add it executing the menu option "Admin. xxx/Add xxx". In the following window you introduce the name and the set of frequencies for an initial automatic search.



DVBS/DVBS2



DVBC

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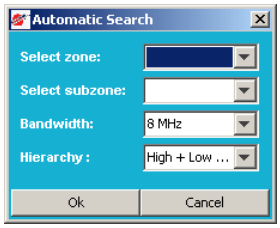
In order to modify the data of a existing satellite/operator, you can select this one from the list, and click on the menu option “Admin. xxx/Modify xxx”. If you want to delete all data about a satellite/operator, you have to select this one and click on “Admin. xxx/Delete xxx”.

Unlike the satellites/operators list, the only modification permitted on the network list, is the deletion. Therefore, if we want to delete the data of a network associated to a satellite/operator, we have to select the network and click on the menu option “Admin. Networks/Delete Network”.

b) Automatic search in DVBT devices

The application shows a window to introduce the world region where we are, the subzone where the results will be saved, the channel bandwidth and the hierarchy that are used for the target services. In the most of the countries the channel bandwidth is 8 MHz, but in other countries can be different (6 or 7 MHz).



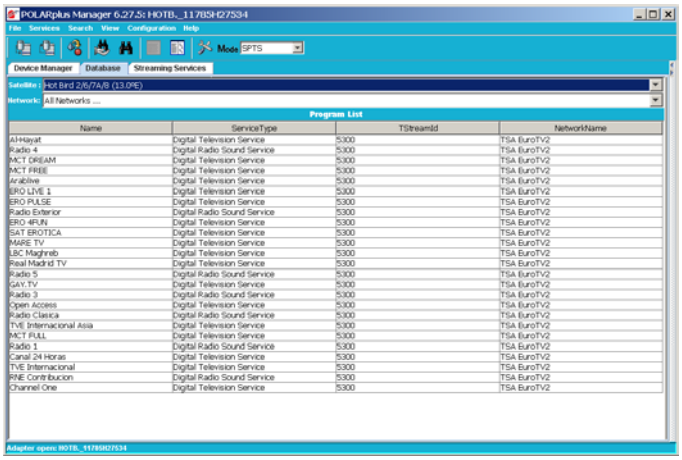
After clicking OK, the application will search for in all available channels in the selected region. In this case, all services that are found, are grouped under a network that is named as the selected subzone. The results are presented in the same way as other searches.

2.4.2.3 Service/Frequency list

After any kind of search in any device, all services that have been found will be stored in a database of services and frequencies. There will be four different databases corresponding to each device type (in case of DVBA, the database will be temporal). The services (SPTS mode) and transponders (MPTS mode) in the database are displayed on **“Database”** tab.

In the case of DVBT devices, the available services/frequencies are grouped in world zones; meanwhile, in the case of DVBS/S2 and DVBC devices, the available services/ frequencies are grouped in satellites or cable operators and networks. In the case of DVBA devices, the available services are only grouped by IP address of the device where they were found.

In order to see the services/ frequencies related to a given zone/satellite/operator/IP and subzone/network, you have to select these parameters from the drop-down lists placed at the top of the window.



DVBS/DVBS2

The following data are displayed for each service:

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- **Name**: Name of the service.
- **Service Type**: Type of the service. It can be:
  - Digital Television Service.
  - Digital Radio Sound Service.
  - Data Broadcast Service.
  - MPEG2 HD Digital Television Service.
  - Unknown Service Type.
- **TstreamId**: Transponder identifier associated to the service.
- **NetworkName**: Name of the network related to the service.

Apart from this data, we can get more information from the selected service through the menu option "View/Advance View" ( ). To click on this option, a new frame appears on the right side of the window, with information about the service: network, frequency, assigned PIDs, conditional access, and other information as name, language, etc… This advance view is kept in the "Streaming Services" tab on the service selected.

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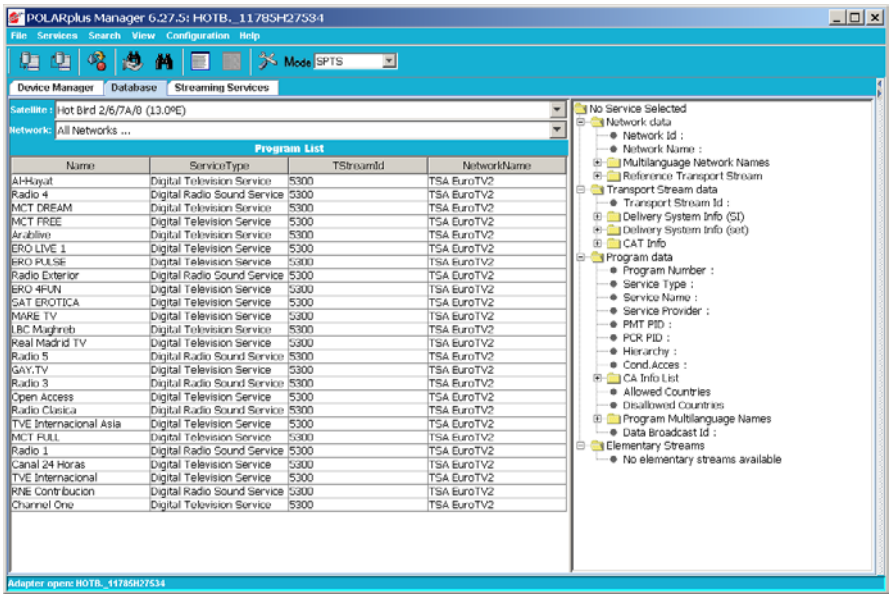
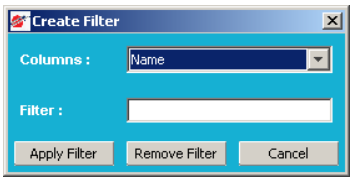

POLARplus Manager 6.27.5: HOTB._11785H27534
File Services Search View Configuration Help
Mode SPTS
Device Manager Database Streaming Services
Satellite : Hot Bird 2/6/7A/8 (13.0ºE)
Network: All Networks ...
Program List
Name ServiceType TStreamId NetworkName
Al-Hayat Digital Television Service 5300 TSA EuroTV2
Radio 4 Digital Radio Sound Service 5300 TSA EuroTV2
MCT DREAM Digital Television Service 5300 TSA EuroTV2
MCT FREE Digital Television Service 5300 TSA EuroTV2
Arabiive Digital Television Service 5300 TSA EuroTV2
ERO LIVE 1 Digital Television Service 5300 TSA EuroTV2
ERO PULSE Digital Television Service 5300 TSA EuroTV2
Radio Exterior Digital Radio Sound Service 5300 TSA EuroTV2
ERO 4FUN Digital Television Service 5300 TSA EuroTV2
SAT EROTICA Digital Television Service 5300 TSA EuroTV2
MARE TV Digital Television Service 5300 TSA EuroTV2
LBC Maghreb Digital Television Service 5300 TSA EuroTV2
Real Madrid TV Digital Television Service 5300 TSA EuroTV2
Radio 5 Digital Radio Sound Service 5300 TSA EuroTV2
GAY.TV Digital Television Service 5300 TSA EuroTV2
Radio 3 Digital Radio Sound Service 5300 TSA EuroTV2
Open Access Digital Television Service 5300 TSA EuroTV2
Radio Clasica Digital Radio Sound Service 5300 TSA EuroTV2
TVE Internacional Asia Digital Television Service 5300 TSA EuroTV2
MCT FULL Digital Television Service 5300 TSA EuroTV2
Radio 1 Digital Radio Sound Service 5300 TSA EuroTV2
Canal 24 Horas Digital Television Service 5300 TSA EuroTV2
TVE Internacional Digital Television Service 5300 TSA EuroTV2
RNE Contribucion Digital Radio Sound Service 5300 TSA EuroTV2
Channel One Digital Television Service 5300 TSA EuroTV2
No Service Selected
Network data
Network Id :
Network Name :
Multilanguage Network Names
Reference Transport Stream
Transport Stream data
Transport Stream Id :
Delivery System Info (SI)
Delivery System Info (sat)
CAT Info
Program data
Program Number :
Service Type :
Service Name :
Service Provider :
PMT PID :
PCR PID :
Hierarchy :
Cond.Acces :
CA Info List
Allowed Countries
Disallowed Countries
Program Multilanguage Names
Data Broadcast Id :
Elementary Streams
No elementary streams available
Adapter opens HOTB._11785H27534

DVBS/DVBS2

In order to manage easier the services list, the application allows applying a filter to one of the previously mentioned four fields. In this way, we can display a subset of services that complies the filter. To define this filter, click on the menu option "View/Filter". Once this is done, the following window comes up:



In this window, we can select the field to filter and the desired value. To apply the filter, we click on "Apply Filter" button. If we want to remove the filter, we click on the menu option "View/Filter", and click on "Remove Filter" button.

The service/frequency list stored in the database is enlarged with the results from consecutive searches. We can delete services from the database in three different ways from the menu “Services”:

- Select a satellite or cable operator name (only for DVBS, DVBS2 and DVBC) from the drop-down list and click on the menu option “Delete xxx”. This option will erase all services/frequencies about the selected satellite/operator.
- Select a network name (for all devices but DVBA) from the drop-down list and click on the menu option “Delete Network”. This option will erase all services/frequencies about the selected network.
- Select one or some services from the list and click on the menu option “Delete Service/s”. This option will erase only the selected services.

All data about the services/transponders that have been found are saved in the file “SystemData.xml” located in the application root path. We can export these data to another file ‘xml’ with the menu option “File/Export Database” ( ). Also, the application presents the option to work with other services lists, importing these data from a file with extension ‘xml’ (it is supposed to be exported previously). In order to do this, you click on the menu option “File/Import Database” and select the file that contains the data ( ).

2.4.3 Definition of the streaming services

In **SPTS** mode, there are three different ways to define a new streaming service:

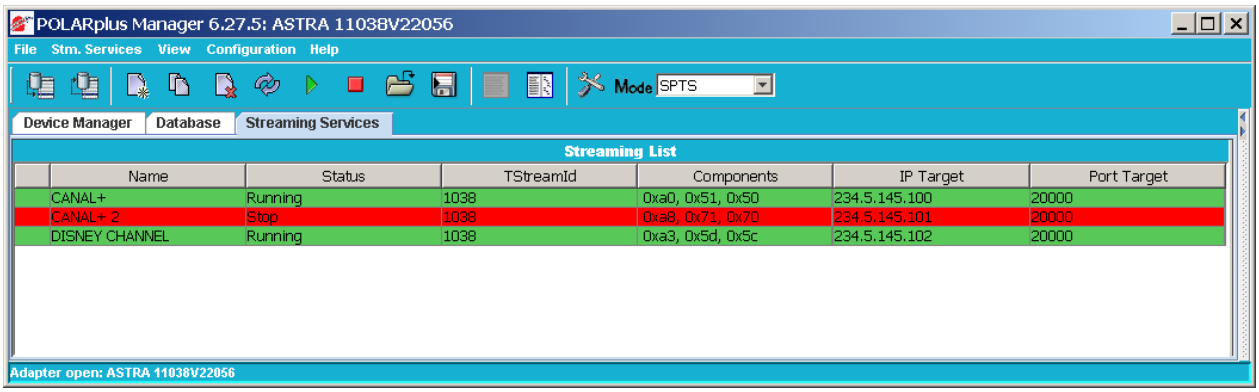
- From a service in the database.
- From a streaming service just defined.
- From information in database with no previous service reference.

Meanwhile, in **MPTS** mode only is possible to define the streaming service from a transponder existing in database (in case of DVBA, it is not necessary any previous information to define the MPTS service).

The streaming services defined for a given device are listed in “**Streaming Services**” tab. The list showed in this tab is associated to the device to configure.

Independently the operation mode, the streaming services configuration can be restored from a file that has been previously saved. The menu options “Stm. Services/**Load Streaming Configuration**” and “Stm. Services/**Save Streaming Configuration**” are used to do this.

An example of streaming services list is the following:


POLARplus Manager 6.27.5: ASTRA 11038V22056
File Stm. Services View Configuration Help
Mode SPTS
Device Manager Database Streaming Services
Streaming List
Name Status TStreamId Components IP Target Port Target
CANAL+ Running 1038 0xa0, 0x51, 0x50 234.5.145.100 20000
CANAL+ 2 Stop 1038 0xa8, 0x71, 0x70 234.5.145.101 20000
DISNEY CHANNEL Running 1038 0xa3, 0x5d, 0x5c 234.5.145.102 20000
Adapter open: ASTRA 11038V22056

⇒ The following data are presented for each streaming SPTS service:

- **Name**: Name of the streaming service.
- **Status**: Status of the streaming service. The possible values are:
  - No Config: the streaming service has just been added to the list and it has not been defined yet in the device.

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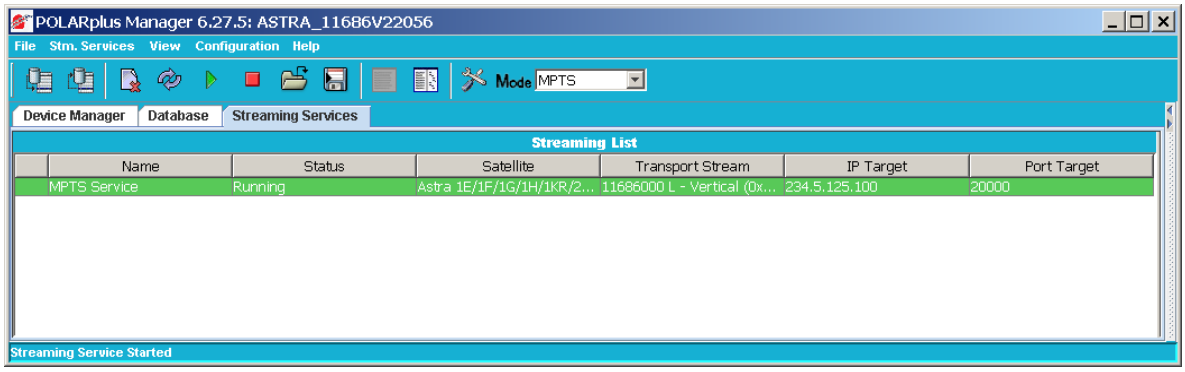
- Running: the streaming service has been defined as “running”; if it is on green, the device is streaming it out, but if it is on yellow the service is either suspended or the device is not receiving signal from.
- Stop: the streaming service has been defined as “stopped”; the device is not streaming it out.

- **TstreamId**: Identifier of the transponder which the service belongs to.
- **Components**: Enumeration of the PIDs that makes up the streaming service.
- **IPTarget**: Multicast/unicast address related to the streaming service. If this value is not introduced before starting the service, the application set automatically a default value for it. Afterwards, you can modify this parameter if you wish.
- **PortTarget**: Target port related to the streaming service.

⇒ Meanwhile, the information presented for a MPTS service is the same except Components and TstreamId, being substituted by the frequency information.


POLARplus Manager 6.27.5: ASTRA_11686V22056
File Stm. Services View Configuration Help
Mode MPTS
Device Manager Database Streaming Services
Streaming List
Name Status Satellite Transport Stream IP Target Port Target
MPTS Service Running Astra 1E/1F/1G/1H/1KR/2... 11686000 L - Vertical (0x... 234.5.125.100 20000
Streaming Service Started

The parameters associated to a streaming service can be modified, whenever this service is not running, making a double click on it, or executing the “Stm Services/Modify Streaming Service” menu option. A more detailed explanation of the edition of these parameters can be located in the paragraph 2.4.3.3.

2.4.3.1 Definition of a streaming service from an existing service/transponder in database

This way to define a streaming service is the more common. From “Database” tab, we select the service or services that we want to define as streaming services. These services pass to the “Streaming Services” clicking on the icon , or on the menu option “Services/Create Streaming Service(s)”. In MPTS mode we can only add a service, but in SPTS mode it is possible to add up to eight services in the same transponder.

In SPTS mode, by default, the application adds up the services only with video and audio PIDs (plus PCR PID); but if the user wants to create the services with all the PIDs that make up them, from “Database” tab, he has to select the menu option “View/Advanced View”, and with the service(s) selected, pulse the menu option “Services/Create Streaming Service(s) with ALL PIDs”. You have to be careful with this alternative because you can add up PIDs that are not necessary for our goal, and run out the device hardware resources; so, if you want to add up any PID different from video or audio, we recommend you add up these PIDs modifying the service created with only video and audio PIDs (menu option “Stm Services/Modify Streaming Service”).

In order to add up the information of some descriptors included in the original PMT associated to the service, we should activate “**Enable PMT Descriptors**” tick and select those we want to introduce. When a descriptor is added, the possible component or components associated are also added; this is the case of the **teletext** descriptor: if we add the teletext descriptor (tag 0x56), the component or PID that contains the teletext data is added up.

A streaming service defined like this, initially presents a “No Config” state and all video and audio PIDs that make up the original service. The generated IP Target belongs to the **multicast** address range and follow the rule configured and explained in the paragraph 9.2. The default value for Port Target is 20000. The default Streaming Mode is **SPTS-UDP** o **MPTS-UDP** depending on the operation mode.

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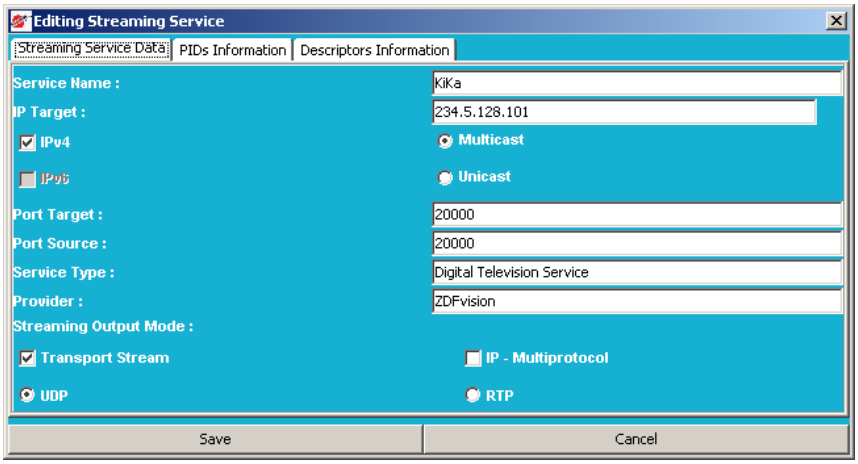
2.4.3.2 Definition of a streaming service from an existing streaming service (SPTS)

In order to define a streaming service from an existing one, we have to select this one and copy it, clicking on the menu option “Stm Services/Copy Streaming Service”.

Once it is copied, the new service will be in the list as a copy of the former but with the PIDs field unassigned. Before the new service can be started, it is necessary to edit the PIDs field. The definition of the rest of the parameters for the new service will follow the rules seen in previous paragraph.

2.4.3.3 Definition of a streaming service with no previous service reference (SPTS)

In order to define a new service, we have to click on the menu option “Stm Services/Add New Streaming Service” (The following window will pops up with different tabs “General Information”, “PIDs Information” and “Descriptors Information”:



“General Information”: this tab includes the basic parameters of the streaming service, as name, IP addressing and streaming mode:

- “**Service Name**”: mandatory field that means the name of the streaming service.
- **“IP Target”**: mandatory field that indicates the target IP address. This address can be configured as multicast or unicast. In case of **multicast** address, this will be in the range 224.0.0.0 – 239.255.255.255. We recommend see the documents RFC 3171 and 2365 for a proper multicast address choice. In this case, the traffic generated from the device for this service is multicast and would be received by all clients joined to this multicast group. See IGMP protocol.

  In case of **unicast** address, the traffic generated from device will reach only the given address.
- **“IP version”**: at this moment, the device only supports version 4. In a future, it will also support version 6.
- “**Port Target**”: mandatory field that means the target port related to the streaming service. This value can be in the range 1026 – 65535 and has to be multiple of 2.
- “**Port Source**”: mandatory field that means the source port related to the streaming service. This value can be in the range 1026 – 65535 and has to be multiple of 2.
- “**Service Type**”: optional field where we can introduce a short description of the streaming service.
- “**Provider**”: optional field where we can introduce the provider name of the streaming service.
- “**Streaming Mode**”: mandatory field that indicates the content type and protocol used in the service streaming: SPTS-UDP, SPTS-RTP and IP-Multiprotocol (MPE) for

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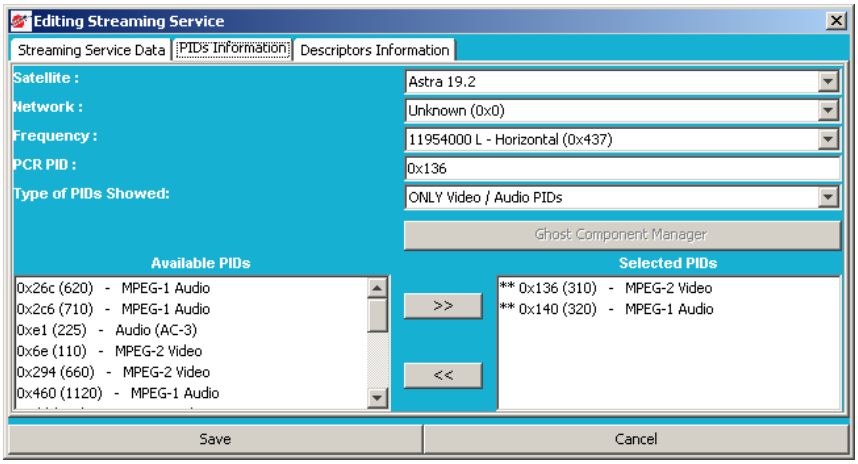
devices in SPTS mode, and MPTS-UDP, MPTS-RTP for devices in MPTS mode (see paragraph 2.4.1).

It exists an additional field for Deluxe version to BISS (Basic Interoperable Scrambling System) decryption, that could be enable or disable. In case of BISS enable, a Control Word has to be introduced:

The information in "PIDs Information" and "Descriptors Information" are only applied for devices in SPTS mode:

"**PIDs Information**": mandatory field that enumerates the list of PIDs to be filtered and streamed out. We can only use the PIDs previously found to fill in this field. For DVBS, DVBT and DVBC devices, these PIDs are associated to frequencies, these are associated to networks and finally these are to satellites for DVBS, subzones and zones for DVBT and cable operators for DVBC. We notice that the list of PIDs only can be made up by PIDs belonging to an unique frequency, and it is not possible more than a video PID. The list of available PIDs can show either VIDEO/AUDIO PIDs or all PIDs that are found in the PMT of all services in the selected transponder. In case that all PIDs are shown, using the "Ghost Component Manager" button, we can add PIDs not present in the PMTs in order to select them.



"**Descriptors Information**": When we create a service, the device generates the following service information tables: PAT, PMT and SDT which refers to the new service created and its components. By default, the PMT doesn't contain any descriptor, and if we want to introduce any type of it, we must tick "Enable PMT Descriptors", and select whatever type we want. Be careful, because the PMT present a length limit, so we can not introduce all we want. If the descriptor has information associated in other components, these components will be automatically added up, when the descriptor is selected. The addition of some descriptors in PMT generation is completely necessary, so any player can recognize some information added to the TS, as teletext or AC3 audio information.

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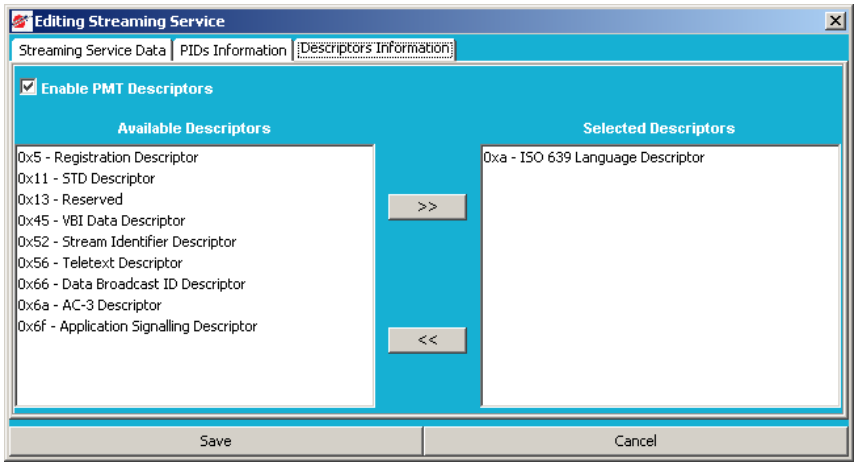

Once we have filled out the data, it is necessary to click on “Save” button to add the service to the “Streaming Services” list.

In the same way we have defined all these parameters for a new streaming service, we can edit or modify it, with the only condition that the service has not be running. To proceed with the service edition, we have to select it and click double on the field to edit, or click on the menu option “Stm Services/Modify Streaming Service”.

Finally, we have to notice that we can delete streaming services from the list, selecting it and clicking on either the menu option “Stm Services/Delete Streaming Service/s”, or the icon .

2.4.4 Start and stop a streaming service

In order to start a streaming service is necessary to select it and click on either the icon or the menu option “Stm Services/Start Streaming Service”. If the communication between application and device has been successful and the streaming service has been started, its status will change to “Running" in green color.

In order to stop a streaming service is necessary to select it and click on either the icon or the menu option “Stm Services/Stop Streaming Service”. If the streaming service has been stopped, its status will change to “Stop" in red color.

2.4.5 Configuration of DVBS/DVBS2 devices sharing the same antenna

This subject only applies to DVBS/DVBS2 devices that are sharing the same LNB, that is, the same cable from the antenna: LNB has to be supplied only by a device (see paragraph 2.3.3). The device that supplies LNB is configured as MASTER, whereas the rest of the devices are configured as SLAVE. In the boards list (Device Manager tab), firstly is the MASTER device followed by the SLAVE devices associated. If there is a SLAVE device associated to a MASTER device not present in the list, this will appear with the status **SLAVE???** in red color.

We **RECOMMEND** to configure the group of devices MASTER – SLAVEs, being connected simultaneously to the network, and configure firstly the MASTER device, and afterwards the SLAVE ones.

The configuration of the MASTER is made normally following the steps previously explained. Once the MASTER device is configured, we proceed with the rest of the devices configured as SLAVE, taking into account that it is only possible to do automatic/manual searches or configure services in transponders at the same band and with the same polarization that the transponder tuned in the MASTER device.

For a better explanation, we are going to analyze a practical example, putting special emphasis on one of the configuration parameters of the LNB (**LNB Switch**): We have three devices with no previous configuration and sharing an universal LNB of an antenna pointing to ASTRA satellite. We want to configure the devices with streaming services in the following transponders:

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- Freq: 11.568 MHzPol: V (RAI Uno, ARTE)
- Freq: 11.597 MHzPol: V (BBC, CNBC)
- Freq: 11.686 MHzPol: V (TVC, TV Galicia)

In an universal LNB, we present the following parameters and their default values:

- LNB Low Frequency (MHz) **=** 9,750 (local oscillator for lower band)
- LNB High Frequency (MHz) = 10,600 (local oscillator for higher band)
- LNB Switch Frequency (MHz) = 11,600

The tuner of the device presents a frequency range 0.95-2.15 GHz and using an universal LNB, the Ku band (10.7 – 12.75 GHz) is completely covered:

- Lower band: 10.70 to 11.9 GHz (9.75+0.95) to (9.75+2.15)
- Higher band: 11.55 to 12.75 GHz (10.6+0.95) to (10.6+2.15)

The parameter “LNB Switch Frequency” fixes the limit between using the lower or higher local oscillator of the LNB.

As we have said before, the transponders tuned by different devices that share the same LNB, must be at the same band and present the same polarization. The three transponders present the same polarization, but according to the LNB parameters, the first two are at the LOW band and the third at the HIGH one. In order to get along the three transponders, we can take advantage of the certain flexibility that LNB Switch parameter presents: it can be slightly modified to 11.700 MHz in a board, so the three transponders are now at the same band (LOW). The configuration would be:

- EtherTV 1: RAI Uno, ARTE. MASTER
- EtherTV 2: BBC, CNBC. SLAVE
- EtherTV 3: TVC, TV Galicia. SLAVE y LNB Switch 11.700 MHz

The flexibility for the “LNB Switch” parameter depends on the value of the LNB local oscillators. For an universal LNB, the LNB Switch Frequency will be in the range 11.55 - 11.9 GHz.

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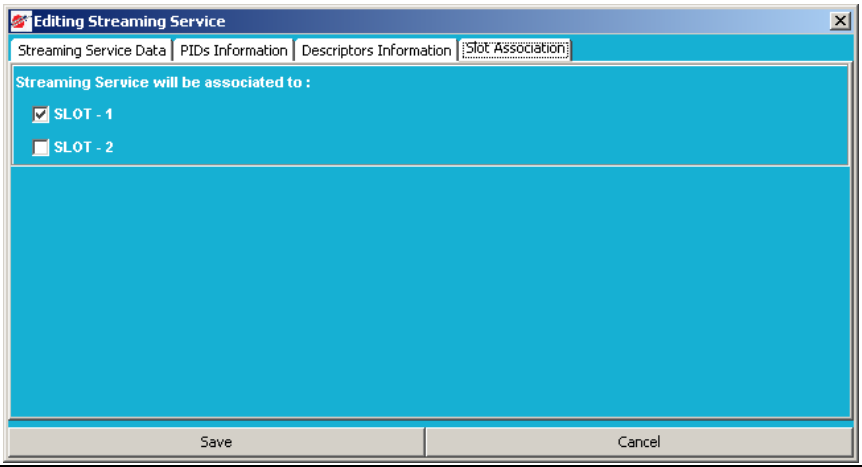
2.4.6 Configuration of services in devices with “Common Interface” option

The configuration of streaming services in a device that includes the hardware option CI is exactly in the same way that in a device with no CI option, but in case we want to descramble services using conditional access modules (CAM), it will be necessary to do an additional configuration step: “**Slot Association**”.

In order to descramble a service using one or two conditional access modules, besides inserting the modules into available CIs, we have to associate the service with the corresponding *slot/s*. In this way, if a service presents a “**Scrambled**” status, and is associated to at least one slot, where a suitable CAM and smartcard are inserted, the service is descrambled and ready to be streamed out.



NOTE 1: Every time you modify the configuration of services associated to slots, it is recommended to RESET the EtherTV board to assure a correct performance.

NOTE 2: The number of decrypted services depends on the CAM.

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3 IP-DVB Gateways

POLARplus Manager is an application that allows the **search**, **monitoring** and **configuration** of the POLARplus devices grouped under the category of *IP-DVB Gateways*. Inside this category the following type of devices are found:

- **etherTV BRIDGE**

All the explanations showed in this chapter apply on this type of devices, and from now to chapter end they will be referred as “devices”.

Using *POLARplus Manager* on these devices, we will be able to carry out some management tasks, as well as the configuration of the ASI stream in the output.

The **management tasks** are:

- Device settings configuration. These settings are the name, network settings, querying status and TTL.
- Update of the firmware embedded on the device.
- Reset of the device, keeping its previous configuration.

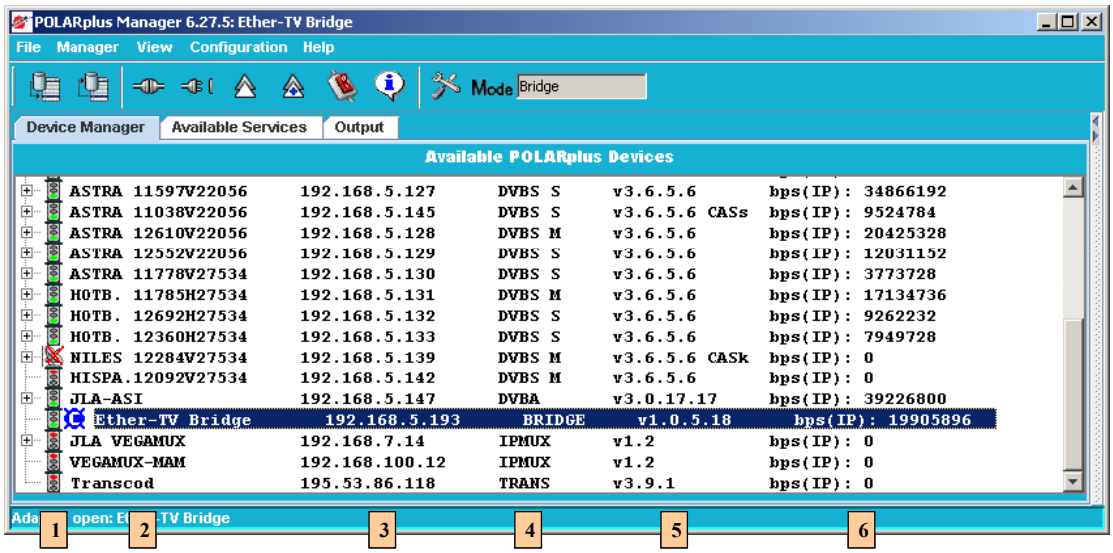
The **configuration** of a device will consist basically in the configuration of the input MPTS service (or two input services in case of the redundancy management is enabled). The outgoing transport stream coincides exactly with the input transport stream, so the device doesn’t process the input transport stream and doesn’t generate any SI tables. It is very important that the input transport stream presents a constant bitrate, and this value will be the most approximate to the configured value.

NOTE: Inside the *IP-DVB Gateways*, we can consider the **etherTV Mux** device because presents IP input and ASI output, but we will explain it inside *IP Multiplexers* section.

3.1 Searching devices

The search for the *IP-DVB Gateways* existing in the local network is automatic. The application continuously shows an updated list of devices in the local network, indicating their status. The *IP-DVB Gateways* present the text **BRIDGE** or **BRIDGE-COFDM** next to IP address.

This information is presented in “Device Manager” tab, and can be seen in the following figure.


POLARplus Manager 6.27.5: Ether-TV Bridge
File Manager View Configuration Help
Mode Bridge
Device Manager
Available Services
Output
Available POLARplus Devices
ASTRA 11597V22056 192.168.5.127 DVBS S v3.6.5.6 bps(IP): 34866192
ASTRA 11038V22056 192.168.5.145 DVBS S v3.6.5.6 CASs bps(IP): 9524784
ASTRA 12610V22056 192.168.5.128 DVBS M v3.6.5.6 bps(IP): 20425328
ASTRA 12552V22056 192.168.5.129 DVBS S v3.6.5.6 bps(IP): 12031152
ASTRA 11778V27534 192.168.5.130 DVBS S v3.6.5.6 bps(IP): 3773728
HOTB. 11785H27534 192.168.5.131 DVBS M v3.6.5.6 bps(IP): 17134736
HOTB. 12692H27534 192.168.5.132 DVBS S v3.6.5.6 bps(IP): 9262232
HOTB. 12360H27534 192.168.5.133 DVBS S v3.6.5.6 bps(IP): 7949728
NILES 12284V27534 192.168.5.139 DVBS M v3.6.5.6 CASk bps(IP): 0
HISPA.12092V27534 192.168.5.142 DVBS M v3.6.5.6 bps(IP): 0
JLA-ASI 192.168.5.147 DVBA v3.0.17.17 bps(IP): 39226800
Ether-TV Bridge 192.168.5.193 BRIDGE v1.0.5.18 bps(IP): 19905896
JLA VEGAMUX 192.168.7.14 IPMUX v1.2 bps(IP): 0
VEGAMUX-MAM 192.168.100.12 IPMUX v1.2 bps(IP): 0
Transcod 195.53.86.118 TRANS v3.9.1 bps(IP): 0
1
2
3
4
5
6

The information showed for every device is the following:

(1) Device Status. The meaning of the possible values is:

- Green light: the device is transmitting.
- Red light: the device is not transmitting because it is not configured.
- Yellow light: the device is only transmitting padding because it is not receiving the input service configured.
- No symbol (Board OFF): the device becomes not present (temporal status).
- Question mark: the device has been manually connected.

(2) Device Name.

(3) Device IP address.

(4) POLARplus device type, that in case of *IP-DVB Gateways* devices will be one of the following value:

- **BRIDGE**: etherTV BRIDGE.
- **BRIDGE-COFDM**: etherTV BRIDGE with COFDM output

(5) Firmware version embedded on device.

(6) Bitrate (Bits/second) coming out from device (ASI output).

We can obtain more information about a given device selecting it with the mouse and using the right button to execute ‘**More Info**’ ( ). The additional information is in relation with the firmware version embedded on device.

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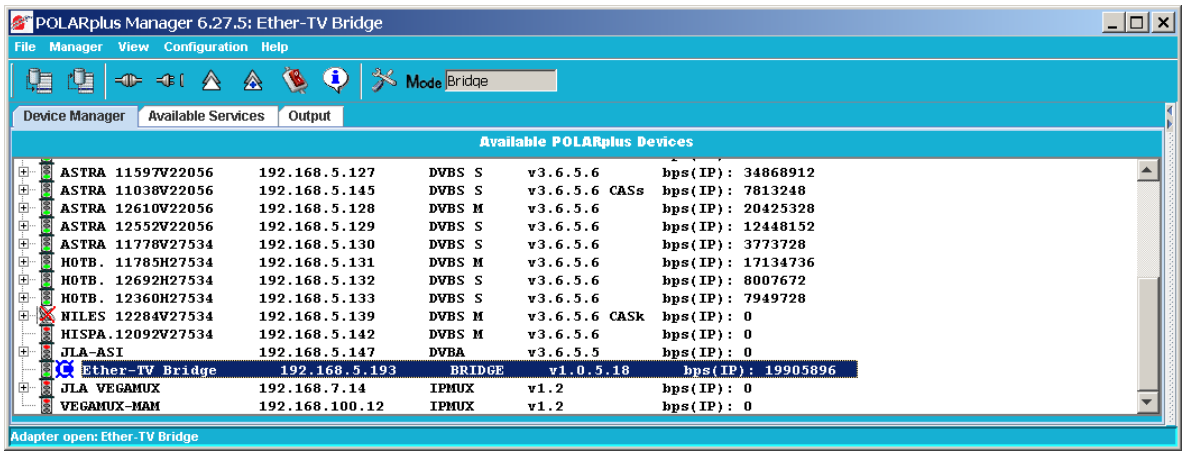
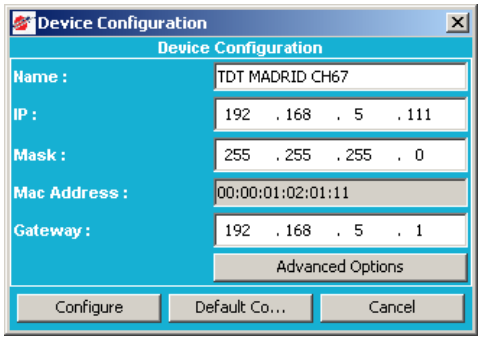
3.2 Management Tasks

The management commands are applied to the **selected** device (highlighted line), but not the “Set Mode” and “Device Settings” commands that are applied to the device **“connected”** (symbol **“C”**). In the following figure you can see that the selected device, and the device connected can be different ones. A selected device is done by a simple click on the desired device, and a device connected can be by three different ways: doing a double click on the device, or selecting the device (simple click) and either clicking on the icon ‘Connect’ ( ) or doing the menu option “Manager/Connect”.


POLARplus Manager 6.27.5: Ether-TV Bridge
File Manager View Configuration Help
Mode Bridge
Device Manager
Available Services
Output
Available POLARplus Devices
ASTRA 11597V22056 192.168.5.127 DVBS S v3.6.5.6 bps(IP): 34868912
ASTRA 11038V22056 192.168.5.145 DVBS S v3.6.5.6 CASs bps(IP): 7813248
ASTRA 12610V22056 192.168.5.128 DVBS M v3.6.5.6 bps(IP): 20425328
ASTRA 12552V22056 192.168.5.129 DVBS S v3.6.5.6 bps(IP): 12448152
ASTRA 11778V27534 192.168.5.130 DVBS S v3.6.5.6 bps(IP): 3773728
HOTB. 11785H27534 192.168.5.131 DVBS M v3.6.5.6 bps(IP): 17134736
HOTB. 12692H27534 192.168.5.132 DVBS S v3.6.5.6 bps(IP): 8007672
HOTB. 12360H27534 192.168.5.133 DVBS S v3.6.5.6 bps(IP): 7949728
NILES 12284V27534 192.168.5.139 DVBS M v3.6.5.6 CASk bps(IP): 0
HISPA.12092V27534 192.168.5.142 DVBS M v3.6.5.6 bps(IP): 0
JLA-ASI 192.168.5.147 DVBA v3.6.5.5 bps(IP): 0
Ether-TV Bridge 192.168.5.193 BRIDGE v1.0.5.18 bps(IP): 19905896
JLA VEGAMUX 192.168.7.14 IPMUX v1.2 bps(IP): 0
VEGAMUX-MAM 192.168.100.12 IPMUX v1.2 bps(IP): 0
Adapter open: Ether-TV Bridge

3.2.1 Configuration of the device parameters

We can configure the device parameters by clicking the menu option “Configuration/Device Settings” ( ). These parameters are: name (the default value is “Ether-TV”), network settings (IP address, net mask and gateway address), “querying” status and TTL value. These two last parameters are inside “Advanced Options”.


Device Configuration
Device Configuration
Name : TDT MADRID CH67
IP : 192 . 168 . 5 . 111
Mask : 255 . 255 . 255 . 0
Mac Address : 00:00:01:02:01:11
Gateway : 192 . 168 . 5 . 1
Advanced Options
Configure
Default Co...
Cancel

The “querying” status parameter is in relation with the multicasting management. Normally, the multicast traffic generated by these devices is distributed through routers and switches that must support IGMPv2. In these distribution networks there must be a “querier” that generates ‘IGMP query’ messages. This function is generally made by a router/switch, but if it is not present you can configure an only one device to perform this function. The port of the switch or router where this “querying” device is attached to, must support all the multicasting traffic existing in this switch/router. The “querying” status of the device can be displayed and modified in “Enable Querier” tick.

The TTL parameter value refers to the value of “Time to Live” field, in the streaming traffic generated from the device. When an IP packet comes in a router/switch, if its TTL is non zero, the packet will be propagated with the TTL decremented by 1. So, this value gives us an idea of the scope for the streaming traffic generated by these devices. The “querying” status and TTL value is configured through the following.

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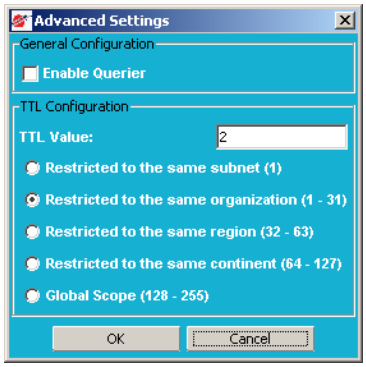

3.2.2 Firmware Update

The *POLARplus Manager* presents the option to update the firmware embedded in the selected device or in all devices existing in the local segment, by clicking the menu options “Manager/Upload” and “Manager/Upload ALL” (and respectively). In both cases, a dialog window comes up, inviting you to introduce the binary file to upload. Once the firmware update is finished, the device will be restarted.

3.2.3 Initialization

The menu option “Manager/Reset” allows initializing the selected device, leaving intact the current configuration including the input service previously configured.

3.2.4 Events Logging

There are two buttons (arrows) in the right border of the main window in order to maximize or minimize the logging window. This window contains a registration of all the events related to any change of the status in the devices or its associated services. Besides, it includes a registration of the commands executed from menu option “Manager”.

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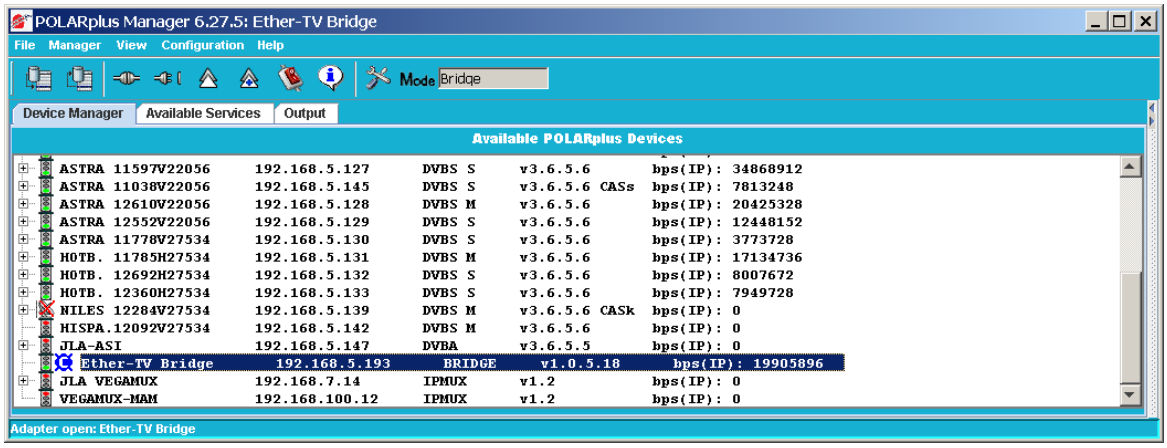
3.3 Configuration

The configuration of a *IP-DVB Gateways* device will consist in the following steps:

- Configuration of the input service.
- Configuration and starting the ASI output.

In order to configure a device, firstly we must **connect** it. We remind you that a board connected is set up by three different ways: doing a double click on the device, or selecting the device (simple click) and either clicking on the 'Connect' icon ( ), or doing the menu option "Manager/Connect".

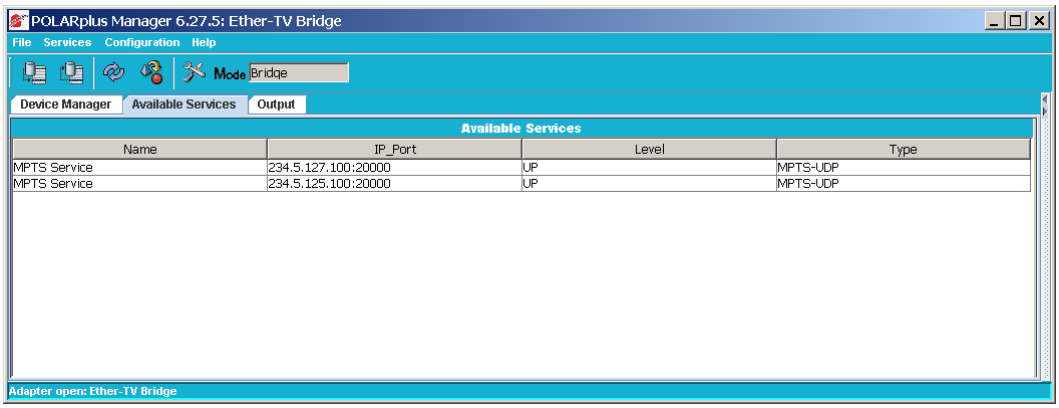

POLARplus Manager 6.27.5: Ether-TV Bridge
File Manager View Configuration Help
Mode Bridge
Device Manager
Available Services
Output
Available POLARplus Devices
ASTRA 11597V22056 192.168.5.127 DVBS S v3.6.5.6 bps(IP): 34868912
ASTRA 11038V22056 192.168.5.145 DVBS S v3.6.5.6 CASs bps(IP): 7813248
ASTRA 12610V22056 192.168.5.128 DVBS M v3.6.5.6 bps(IP): 20425328
ASTRA 12552V22056 192.168.5.129 DVBS S v3.6.5.6 bps(IP): 12448152
ASTRA 11778V27534 192.168.5.130 DVBS S v3.6.5.6 bps(IP): 3773728
HOTB. 11785H27534 192.168.5.131 DVBS M v3.6.5.6 bps(IP): 17134736
HOTB. 12692H27534 192.168.5.132 DVBS S v3.6.5.6 bps(IP): 8007672
HOTB. 12360H27534 192.168.5.133 DVBS S v3.6.5.6 bps(IP): 7949728
NILES 12284V27534 192.168.5.139 DVBS M v3.6.5.6 CASk bps(IP): 0
HISPA.12092V27534 192.168.5.142 DVBS M v3.6.5.6 bps(IP): 0
JLA-ASI 192.168.5.147 DVBA v3.6.5.5 bps(IP): 0
Ether-TV Bridge 192.168.5.193 BRIDGE v1.0.5.18 bps(IP): 19905896
JLA VEGAMUX 192.168.7.14 IPMUX v1.2 bps(IP): 0
VEGAMUX-MAM 192.168.100.12 IPMUX v1.2 bps(IP): 0
Adapter open: Ether-TV Bridge

We can configure a device not listed (the application couldn't detect it), if we know that it is available (check by a **ping** to the IP address using a command console) and we know its IP address. We have to click in the menu option "Manager/Manual connection". If the application achieves to connect the device, this will be added to the list with an unknown state (?).

3.3.1 Configuration of the input service

In order to define this service, we can start from the "Available Services" where the application shows up all MPTS services originated from POLARplus devices in the local network. From this list, we can select the MPTS service to transmit clicking on the menu option "Services/Set as Output" or clicking on the icon. The service will be passed to the "Output" tab.

We can also configure two input MPTS services selecting two services. In this case the redundancy management is enabled.



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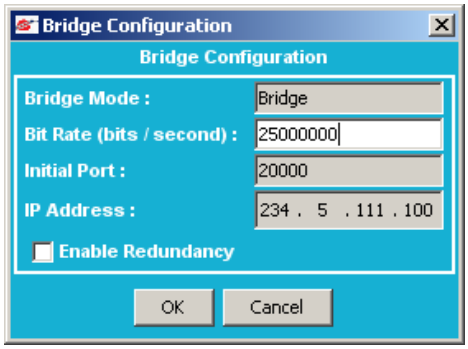
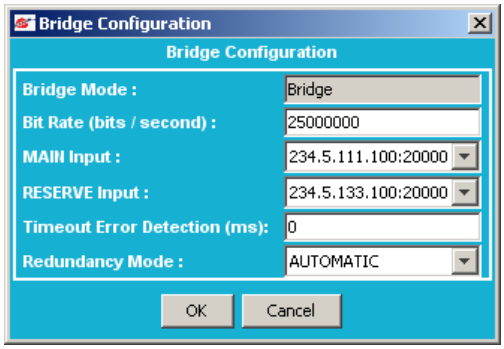
In case of an input service comes from a device different from a POLARplus device, so it is not in the "Available Services" list, it can be configured from "Output" tab by menu option "Output/Add New Input Service" ( ). Then, the application will invite us to introduce the input streaming parameters: IP address and port.

At any moment, we can delete the output configured for the device by clicking on either the menu option "Output/Delete Output", or icon.

3.3.2 Configuration and starting the ASI output

Once the input services (one or two) have been selected, we can configure the ASI output by either "Output/ Start/Config Output" menu option, or clicking on the icon in the "Output" tab.





The left figure depicts the configuration window when only one input (Main) has been selected. A second input (Reserve) can be configured for a redundancy scheme by clicking on "Enable Redundancy" tick.

The right figure represent the configuration window when two inputs have been selected. Main and Reserve inputs can be selected from the initially configured.

The common parameter to configure is:

Bitrate: the bitrate configured corresponds to the input MPTS service bit rate, so it is necessary to know this value as precisely as we can (± 30 ppm). Under some circumstances, we can obtain the right value:

1. In case of the input service comes from a demodulation stage or has passed through a MIP Inserter, we can calculate the exact bit rate using some formulas that can be found in appendix B.
2. In case of the input service comes from Vega Encapsulator or Vega Mux, the value to introduce is the value programmed in this device (Output Bitrate (bps)).
3. There is a third alternative to assign a right value, only available from firmware version 1.0.5.18. This method consists of that EtherTV Bridge device automatically calculates the input bit rate, and uses this value. In order to apply this method, a "0" value must be programmed into Bit Rate field. This alternative is still under evaluation.

Notice that under redundancy schemes, it is supposed that both inputs have exactly the same bitrate.

The redundancy configuration has the following parameters:

Redundancy Mode. The redundancy scheme can be

1. ***Automatic***: Initially, the Main input is bridged to the ASI output. In case of the current bridged input is not present (no PAT detected) during the timeout error detection period, the bridged input will change to the other (Main to Reserve or vice versa). If the two inputs are not present, EtherTV Bridge is continuously (every timeout period) changing the bridged input, until one will be present.
2. ***Semi-automatic***: Initially, the Main input is bridged to the ASI output. In case the Main input fails during the timeout error detection period, the bridged input will change to the

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Reserve one, but does not change anymore: if the Reserve input fails the bridged input does not change. In this case the only way to switch to the Main input is using the manual switching (“Output/ Switch Input”).

3. ***Manual***: The only possible change of the bridged input is using the menu option “Output/ Switch Input”.

Timeout Error Detection. This is the time period during which PAT is not detected in the current bridged input and occurs a fail condition.

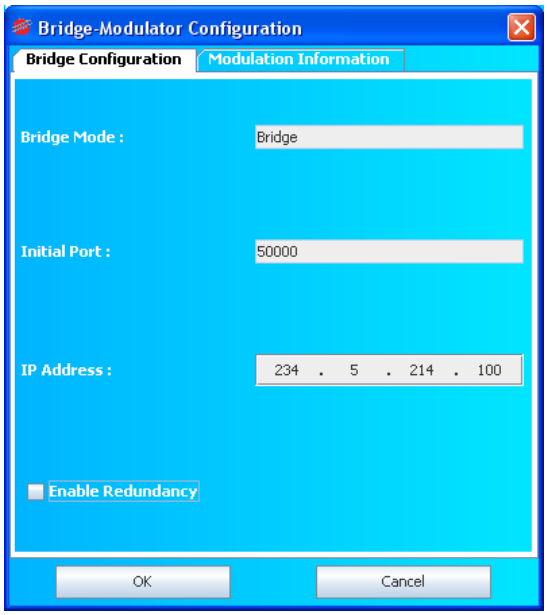
Independently the redundancy scheme configured, it is always possible to change manually the input bridged to the ASI output using the menu option “Output/ Switch Input”.

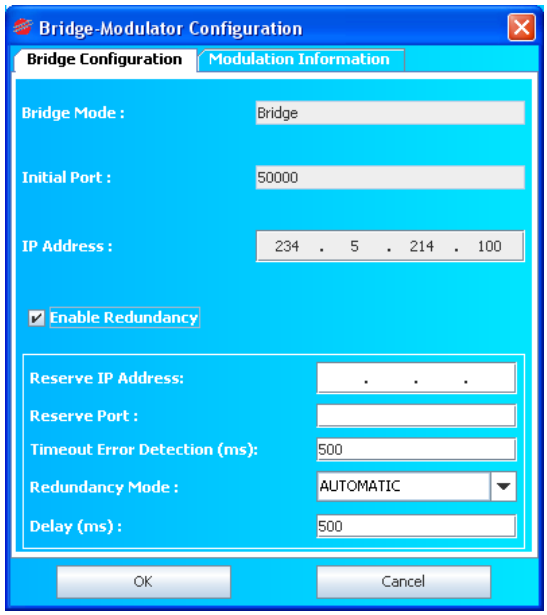
Once the configuration is done, the ASI transmission can be started pressing the “OK” button, and in case the configuration doesn’t have any problem, the output service will become in green color. If the colour becomes yellow means that the input service is not reaching the device and only padding is being transmitted.

At any moment, the ASI output configuration can be changed by clicking on either the menu option “Output/Start Config Output”, or icon.

3.3.3 Configuration and starting the COFDM output

Once the input services (one or two) have been selected, we can configure the ASI output by either “Output/ Start/Config Output” menu option, or clicking on the icon in the “Output” tab.





The left figure depicts the configuration window when only one input (Main) has been selected. A second input (Reserve) can be configured for a redundancy scheme by clicking on “Enable Redundancy” tick.

The right figure represent the configuration window when two inputs have been selected. Main and Reserve inputs can be selected from the initially configured.

For redundancy configuration, please, refer to previous chapter “3.3.2 Configuration and starting the ASI output”.

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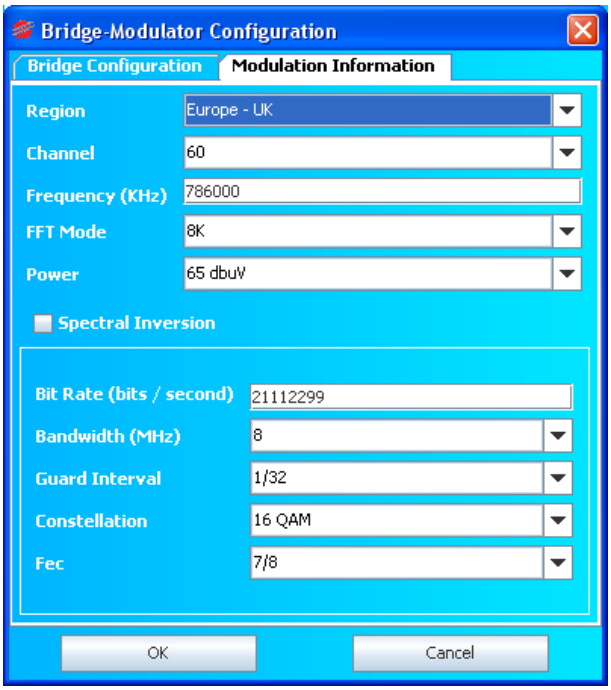
To configure the COFDM output, we have to selct “Modulation Information” tab.



Te selected **Region** will determine the frequency of the channels, the bandwidth and the FFT Mode

We can select any **Channel** in the range of 35 –69 for Europe.

Output **Power** of the COFDM modulator can be configured between 50 and 70dbuV in 5db steps.

We have two options to configure modulation parameters, we can configure the TS bitrate, in this case modulation parameters will automatically adjust to that bitrate. Or we can directly select the desired modulation parameters, then, the bitrate will be determined by those parameters

.

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4 Transcoders

POLARplus Manager is an application that allows the **search**, **monitoring** and **configuration** of the POLARplus devices grouped under the category of *Transcoders*. Inside this category the following type of devices are found:

- **ursus Transcoder**

All the explanations showed in this chapter apply on this type of devices, and from now to chapter end they will be referred as “devices”.

Using *POLARplus Manager* on these devices, we will be able to carry out some management tasks, as well as the configuration of the streaming services (referred as “transcoded services”).

The **management tasks** are:

- Device settings configuration. These settings are the name, network settings, SAPs cadence and connection timeout.
- Reading and writing of the device licence.
- Update of the firmware embedded on the device.
- Reset of the device, keeping its previous configuration.
- Suspend and resume the streaming coming out from the device.

The **configuration** of a device will consist basically in the definition of the input services to transcode, set up the transcoding parameters and finally, configure the IP parameters of the transcoded services to stream out (IP address, port and TTL).

It is very important to notice that the input services to transcode must be **SPTS** (Single Program Transport Stream) encapsulated in IP using UDP or RTP protocols. The output transcoded services will be either SPTS encapsulated in IP using UPD or RTP protocols, or **Raw-RTP** (“elementary streams” encapsulated with RTP).

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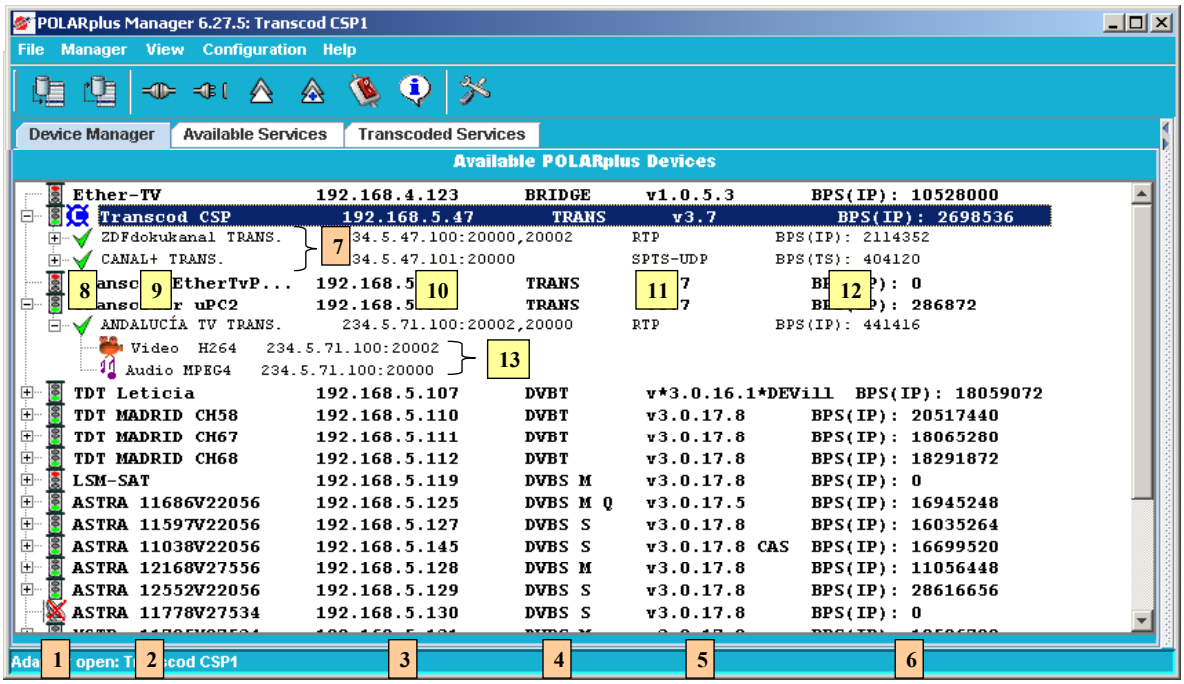
4.1 Searching devices

The search for the *Transcoders* existing in the local network is automatic. The application continuously shows an updated list of devices in the local network, indicating their status. The *Transcoders* devices present the text **TRANS** next to IP address.

This information is presented in “Device Manager” tab, and can be seen in the following figure.


POLARplus Manager 6.27.5: Transcod CSP1
File Manager View Configuration Help
Device Manager
Available Services
Transcoded Services
Available POLARplus Devices
Ether-TV 192.168.4.123 BRIDGE v1.0.5.3 BPS(IP): 10528000
Transcod_CSP 192.168.5.47 TRANS v3.7 BPS(IP): 2698536
ZDFdokukanal TRANS. 234.5.47.100:20000,20002 RTP BPS(IP): 2114352
CANAL+ TRANS. 234.5.47.101:20000 SPTS-UDP BPS(TS): 404120
TDT Leticia 192.168.5.107 DVBT v*3.0.16.1*DEVill BPS(IP): 18059072
TDT MADRID CH58 192.168.5.110 DVBT v3.0.17.8 BPS(IP): 20517440
TDT MADRID CH67 192.168.5.111 DVBT v3.0.17.8 BPS(IP): 18065280
TDT MADRID CH68 192.168.5.112 DVBT v3.0.17.8 BPS(IP): 18291872
LSM-SAT 192.168.5.119 DVBS M v3.0.17.8 BPS(IP): 0
ASTRA 11686V22056 192.168.5.125 DVBS M Q v3.0.17.5 BPS(IP): 16945248
ASTRA 11597V22056 192.168.5.127 DVBS S v3.0.17.8 BPS(IP): 16035264
ASTRA 11038V22056 192.168.5.145 DVBS S v3.0.17.8 CAS BPS(IP): 16699520
ASTRA 12168V27556 192.168.5.128 DVBS M v3.0.17.8 BPS(IP): 11056448
ASTRA 12552V22056 192.168.5.129 DVBS S v3.0.17.8 BPS(IP): 28616656
ASTRA 11778V27534 192.168.5.130 DVBS S v3.0.17.8 BPS(IP): 0
ANDALUCÍA TV TRANS. 234.5.71.100:20002,20000 RTP BPS(IP): 441416
Video H264 234.5.71.100:20002
Audio MPEG4 234.5.71.100:20000
1
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12
13

The information showed for every device is the following:

(1) Device Status. The meaning of the possible values is:

- Green light: the device is streaming out at least one service.
- Red light: the device is not streaming out any service.
- Yellow light: temporary status, in which the device is initializing.
- No light: device without licence.
- No symbol (Board OFF): the device becomes not present (temporal status).
- Question mark: the device has been manually connected.

(2) Device Name.

(3) Device IP address.

(4) POLARplus device type, that in case of *Transcoders* devices will be the following value:

- **TRANS**: ursus Transcoder.

(5) Firmware version embedded on device.

(6) Bitrate (Bits/second) coming out from device, including the ethernet, IP … headers.

(7) List of transcoded services configured in device.

The following information is showed for every transcoded service (extended information):

(8) The service status. The meaning for the possible values is:

- Green tick: the service is configured as running and it is being streamed out.

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- Yellow tick: the service is configured as running but it is not being streamed out, because the device is suspended or the input service is not coming in.
- Red Cross: the service is configured as stopped.

(9) The name of the transcoded service.

(10) The multicast/unicast address and port number associated with the transcoded service.

(11) The streaming mode: SPTS-UDP, SPTS-RTP or Raw-RTP.

(12) Bitrate (Bits/second) related with the streaming service. The measure is only about transport stream.

(13) PIDs list associated to the service (extended information). Only video and audio PIDs are showed.

We can obtain more information about a given device selecting it with the mouse and using the right button to execute '**More Info**' ( ). The additional information is in relation with the firmware version embedded on device.

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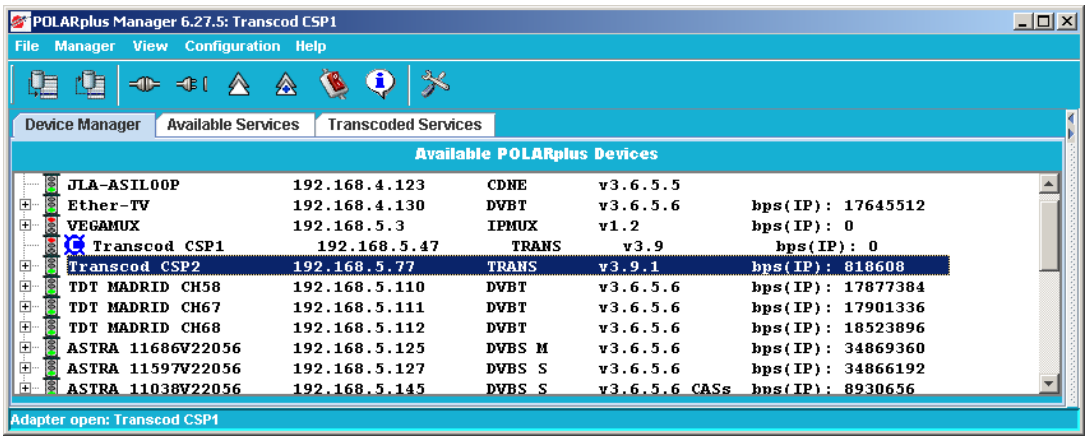
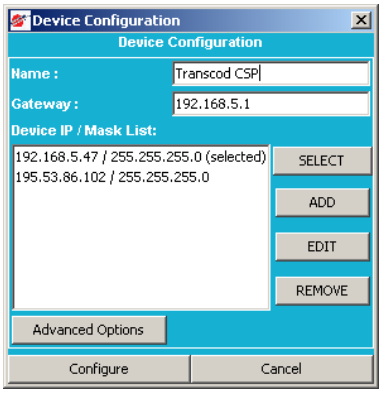
4.2 Management Tasks

The management commands are applied to the **selected** device (highlighted line), but not the "Device Settings" and "Device Licence" commands that are applied to the device **"connected"** (symbol **"C"**). In the following figure you can see that the selected device, and the device connected can be different ones. A selected device is done by a simple click on the desired device, and a device connected can be by three different ways: doing a double click on the device, or selecting the device (simple click) and clicking on the 'Connect' icon ( ) or doing the menu option "Manager/Connect".

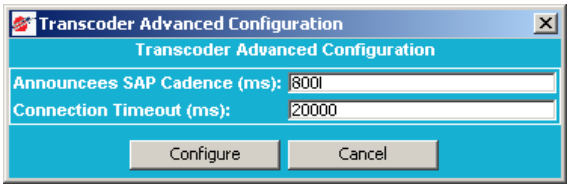

POLARplus Manager 6.27.5: Transcod CSP1
File Manager View Configuration Help
Device Manager
Available Services
Transcoded Services
Available POLARplus Devices
JLA-ASIL00P 192.168.4.123 CDNE v3.6.5.5
Ether-TV 192.168.4.130 DVBT v3.6.5.6 bps(IP): 17645512
VEGAMUX 192.168.5.3 IPMUX v1.2 bps(IP): 0
Transcod CSP1 192.168.5.47 TRANS v3.9 bps(IP): 0
Transcod CSP2 192.168.5.77 TRANS v3.9.1 bps(IP): 818608
TDT MADRID CH58 192.168.5.110 DVBT v3.6.5.6 bps(IP): 17877384
TDT MADRID CH67 192.168.5.111 DVBT v3.6.5.6 bps(IP): 17901336
TDT MADRID CH68 192.168.5.112 DVBT v3.6.5.6 bps(IP): 18523896
ASTRA 11686V22056 192.168.5.125 DVBS M v3.6.5.6 bps(IP): 34869360
ASTRA 11597V22056 192.168.5.127 DVBS S v3.6.5.6 bps(IP): 34866192
ASTRA 11038V22056 192.168.5.145 DVBS S v3.6.5.6 CASs bps(IP): 8930656
Adapter open: Transcod CSP1

4.2.1 Configuration of the device parameters

We can configure the device parameters by clicking the menu option "Configuration/Device Settings" ( ). These parameters are: name (the default value is "Transcod"), network settings (IP address, net mask and gateway address), SAPs cadence and connection timeout. These two last parameters are inside "Advanced Options".



The SAPs (Session Announcement Protocol) are IP packets sent by device to announce itself to the configuration tool *POLARplus Manager,* and the connection timeout is the maximum time that application waits for a device response to any command. Normally these parameters are not necessary to be changed.



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4.2.2 Device Licence

Apart from the licence of the configuration tool *POLARplus Manager* that is provided to the customer, the device has its own licence that is compatible with the former for a correct operation between device and application. Normally, this license is already installed in the device when is shipped to the customer. But in the case that accidentally the license was damaged or was incorrect, the customer has the possibility to change the license embedded in the device, using the menu option "Configuration/Device Licence/Set Licence File". In any case the license should be generated by SIDSA "preLicence.dat" file that customer can obtain by means of the menu option "Configuration/Device Licence/Get Prelicence File".

The number of services that a device is able to transcode, besides the limitation imposed by the device hardware, depends on the device licence. The possibility to change this value can be very interesting in some scenarios.

4.2.3 Firmware Update

The *POLARplus Manager* presents the option to update the firmware embedded in the selected device or in all devices existing in the local segment, by clicking the menu options “Manager/Upload” and “Manager/Upload ALL” (and respectively). In both cases, a dialog window comes up, inviting you to introduce the binary file to upload. Once the firmware update is finished, the device will be restarted.

4.2.4 Initialization

The menu option “Manager/Reset” allows to initialize the selected device, leaving intact the current configuration including the transcoded services previously configured.

4.2.5 Events Logging

There are two buttons (arrows) in the right border of the main window in order to maximize or minimize the logging window. This window contains a registration of all the events related to any change of the status in the devices or its associated services. Besides, it includes a registration of the commands executed from menu option “Manager”.

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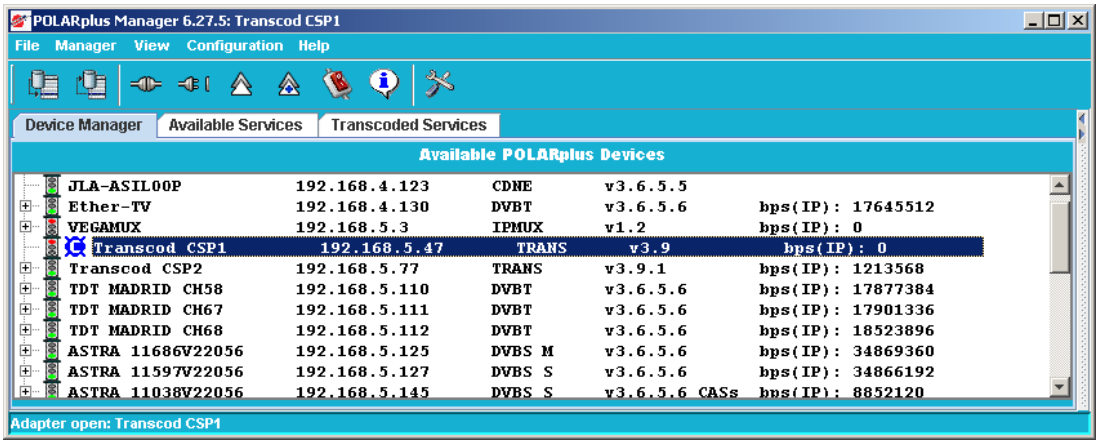
4.3 Configuration

The configuration of a device *Transcoder* will consist in the following steps:

- Configuration of the input services to transcode.
- Configuration of the transcoding parameters.
- Configuration of the output streaming parameters (name, TTL, streaming mode, PIDs remapping, IP address and port).
- Start and stop of the transcoded services.

In order to configure a device, firstly we must **connect** it. We remind you that a board connected is set up by three different ways: doing a double click on the device, or selecting the device (simple click) and clicking the 'Connect' icon or doing the menu option "Manager/Connect".


POLARplus Manager 6.27.5: Transcod CSP1
File Manager View Configuration Help
Device Manager
Available Services
Transcoded Services
Available POLARplus Devices
JLA-ASIL00P 192.168.4.123 CDNE v3.6.5.5
Ether-TV 192.168.4.130 DVBT v3.6.5.6 bps(IP): 17645512
VEGAMUX 192.168.5.3 IPMUX v1.2 bps(IP): 0
Transcod CSP1 192.168.5.47 TRANS v3.9 bps(IP): 0
Transcod CSP2 192.168.5.77 TRANS v3.9.1 bps(IP): 1213568
TDT MADRID CH58 192.168.5.110 DVBT v3.6.5.6 bps(IP): 17877384
TDT MADRID CH67 192.168.5.111 DVBT v3.6.5.6 bps(IP): 17901336
TDT MADRID CH68 192.168.5.112 DVBT v3.6.5.6 bps(IP): 18523896
ASTRA 11686V22056 192.168.5.125 DVBS M v3.6.5.6 bps(IP): 34869360
ASTRA 11597V22056 192.168.5.127 DVBS S v3.6.5.6 bps(IP): 34866192
ASTRA 11038V22056 192.168.5.145 DVBS S v3.6.5.6 CASs bps(IP): 8852120
Adapter open: Transcod CSP1

We can configure a device not listed (the application couldn't detect it), if we know that it is available (check by a **ping** to the IP address using a command console) and we know its IP address. We have to click in the menu option "Manager/Manual connection". If the application achieves to connect the device, this will be added to the list with an unknown state (?).

Before analyzing the configuration of the transcoded services, we are going to see the different possibilities for the streaming mode in a transcoded service.

4.3.1 Streaming Mode

The streaming mode of a service refers to the content and encapsulation protocol over what is sent via ethernet related to the service. The transcoded service can be configured as **SPTS** (Single Program Transport Stream) or Raw-RTP (Elementary Stream):

4.3.1.1 SPTS

Using the streaming SPTS mode, the output stream is a transport stream encapsulated with UDP or RTP protocols (SPTS-UDP and SPTS-RTP respectively). In this case the output stream is addressed to a target IP address and port. This addressing can be unicast or multicast.

4.3.1.2 Raw-RTP

Using the streaming Raw-RTP mode, the output stream is a set of "elementary streams" encapsulated with RTP protocol. These "elementary streams" corresponds to the service components, and they are sent to a unique IP address and different ports. The use of ports, even and consecutive is mandatory by this standard.

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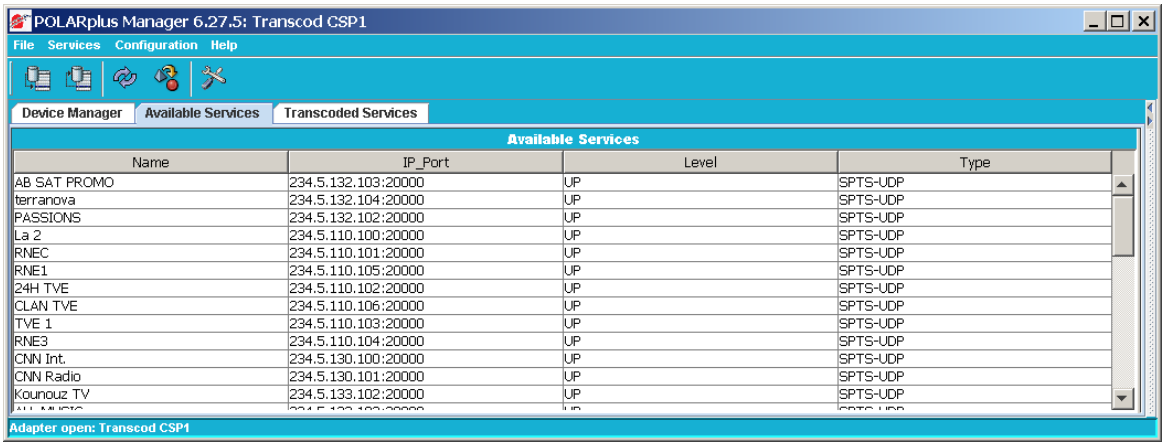
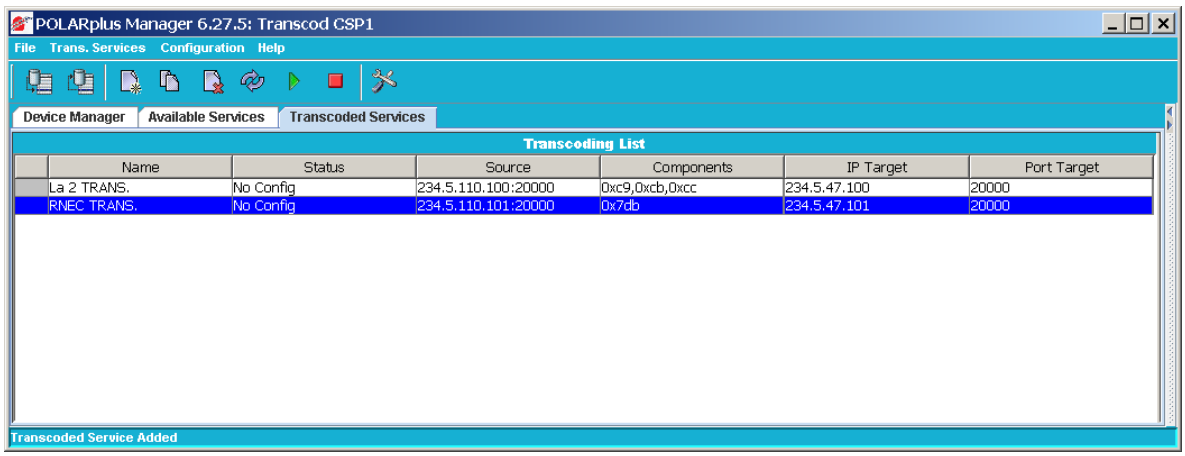
When a transcoded service is configured under this streaming mode, the device generates a file SDP (Session Description Protocol) that can be exported selecting the service in “Transcoded Services” tab and using “Trans. Services / Save SDP Information” menu option in order to be used from other hosts. This file can be used by standard compatible players (QuickTime, VLC, RealPlayer, etc...) to play the related service.

4.3.2 Configuration of the input services to transcode

In order to define the transcoded services, we can start from the available service list in “Available Services” tab, where SPTS services originated from POLARplus devices in the local network are available. From this list we can select the services to transcode and add them up to “Transcoded Services” tab by clicking either the menu option “Services/Transcode Services” or icon . The created services present an input streaming configuration according to the input services (only video and audio components are added).


POLARplus Manager 6.27.5: Transcod CSP1
File Services Configuration Help
Device Manager Available Services Transcoded Services
Available Services
Name IP_Port Level Type
AB SAT PROMO 234.5.132.103:20000 UP SPTS-UDP
terranova 234.5.132.104:20000 UP SPTS-UDP
PASSIONS 234.5.132.102:20000 UP SPTS-UDP
La 2 234.5.110.100:20000 UP SPTS-UDP
RNEC 234.5.110.101:20000 UP SPTS-UDP
RNE1 234.5.110.105:20000 UP SPTS-UDP
24H TVE 234.5.110.102:20000 UP SPTS-UDP
CLAN TVE 234.5.110.106:20000 UP SPTS-UDP
TVE 1 234.5.110.103:20000 UP SPTS-UDP
RNE3 234.5.110.104:20000 UP SPTS-UDP
CNN Int. 234.5.130.100:20000 UP SPTS-UDP
CNN Radio 234.5.130.101:20000 UP SPTS-UDP
Kounouz TV 234.5.133.102:20000 UP SPTS-UDP
Adapter open: Transcod CSP1


POLARplus Manager 6.27.5: Transcod CSP1
File Trans. Services Configuration Help
Device Manager Available Services Transcoded Services
Transcoding List
Name Status Source Components IP Target Port Target
La 2 TRANS. No Config 234.5.110.100:20000 0xc9,0xcb,0xcc 234.5.47.100 20000
RNEC TRANS. No Config 234.5.110.101:20000 0x7db 234.5.47.101 20000
Transcoded Service Added

If the input streaming to transcode comes from a device different from a POLARplus device, so it is not in the available services list, it can be added to “Transcoded Services”, from this tab and executing the menu option “Trans Services/Add New Transcoded Service” ( ). Then, the application will invite us to introduce the input streaming parameters to create the transcoded service:

- IP address and port of the service to transcode.
- Component list to include in the transcoding.

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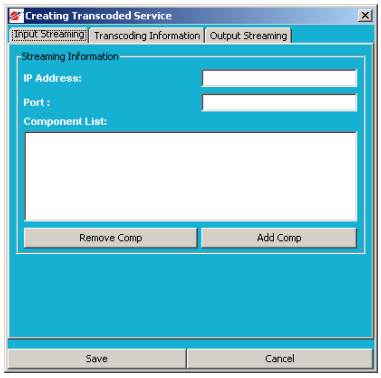

In both cases, once the input services has been added, only the component list can be modified. If we want to change the IP address or port, a new transcoded service has to be configured with the new parameters.

It is very important to check if there are various audio components, so in case of using SPTS-UDP or SPTS-RTP as streaming mode, there can be problems in the audio synchronization, even this question will mainly depend on the player to use. If this problem exists, we can decide to use only an audio component, removing the others.

The transcoded services just generated present a “No Config” status and a default configuration for the transcoding and output streaming parameters. The services are not really created and therefore registered, until they are not started.

At any moment, independently their status, the transcoded services can be deleted by clicking either the menu option “Trans. Services/Delete Transcoded Service(s)” or the icon.

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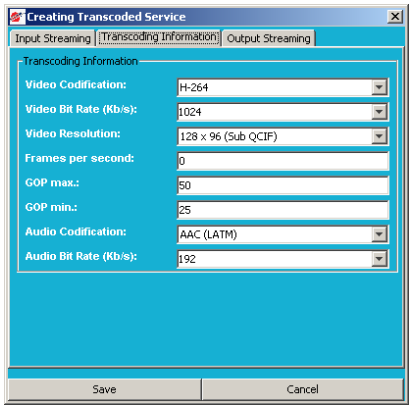
4.3.3 Configuration of the transcoding parameters

The transcoding parameters edition is carried out in “Transcoding Information” tab in the “Modify Transcoded Service” window. The transcoding parameters that can be modified are the following:

- Codification and video bitrate.
- Video resolution.
- Frames per second: this value can be from 10 to 30. If it is zero, the frame rate is the same as in the input service.
- GOP (Group of pictures).
- Codification and audio bitrate.

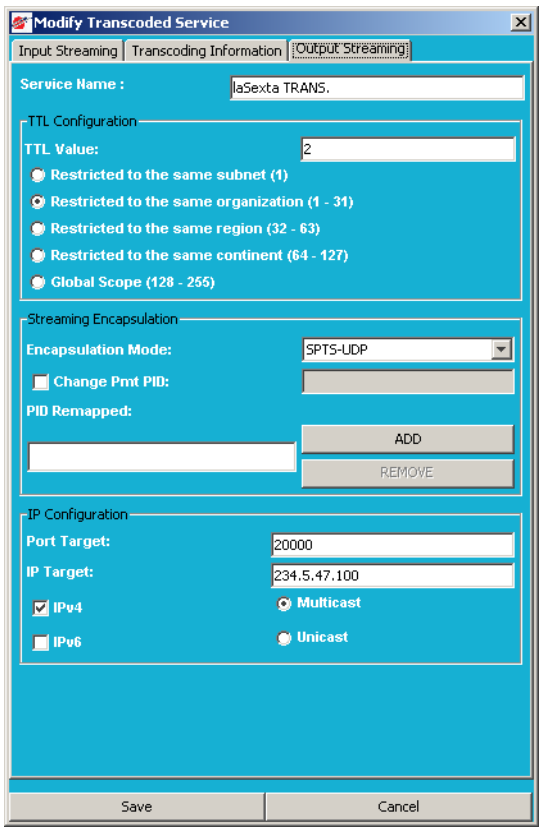


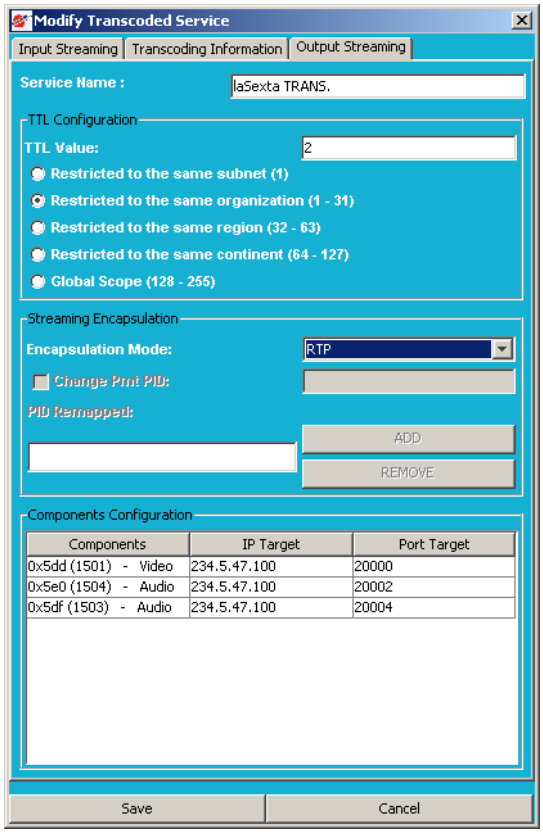
4.3.4 Configuration of the output streaming parameters

The output streaming parameters edition is carried out in the “Output Streaming” tab in the “Modify Transcoded Service” window. The output streaming parameters that can be modified are the following:

- Name of the transcoded service.
- TTL of the generated streaming: this value refers to the value of “Time To Live” field, in the streaming traffic generated from the device. When an IP packet comes in a router/switch, if its TTL is non zero, the packet will be propagated with the TTL decremented by 1. So, this value gives us an idea of the scope for the streaming traffic generated by these devices
- Streaming Mode: the streaming mode of a service refers to the content and encapsulation protocol over what is sent via ethernet related to the service. In case of **SPTS-UDP** or **SPTS-RTP**, the output streaming is transport stream encapsulated with UDP or RTP respectively. In case of **Raw-RTP**, the output streaming will consist of “elementary streams” set (ES), encapsulated in IP with RTP and addressed to a same IP address but different ports (even and consecutive ports).
- PIDs remapping: In case of streaming mode SPTS-UDP or SPTS-RTP, there is the possibility to remap the PMT and components PIDs.
- IP address and port target: the addressing can be multicast or unicast; as we have previously said, in case of SPTS-UDP or SPTS-RTP streaming, only a port is used, but in case of Raw-RTP, there will be as many ports as different components (even and consecutive ports).

In the two following windows, we show an example of output streaming configuration in case of SPTS and Raw streaming modes:





4.3.5 Start and stop of the transcoded services

Once the transcoded services have been defined, they can be started by clicking on icon or the menu option “Trans Services/Start Transcoded Service”. The first time the service is started; this is saved in the device. In case of configuration and starting successful with no errors, the service status becomes to “running” (green colour), information that can be observed in the “Transcoded Services” tab, and in the service list “Device Manager”.

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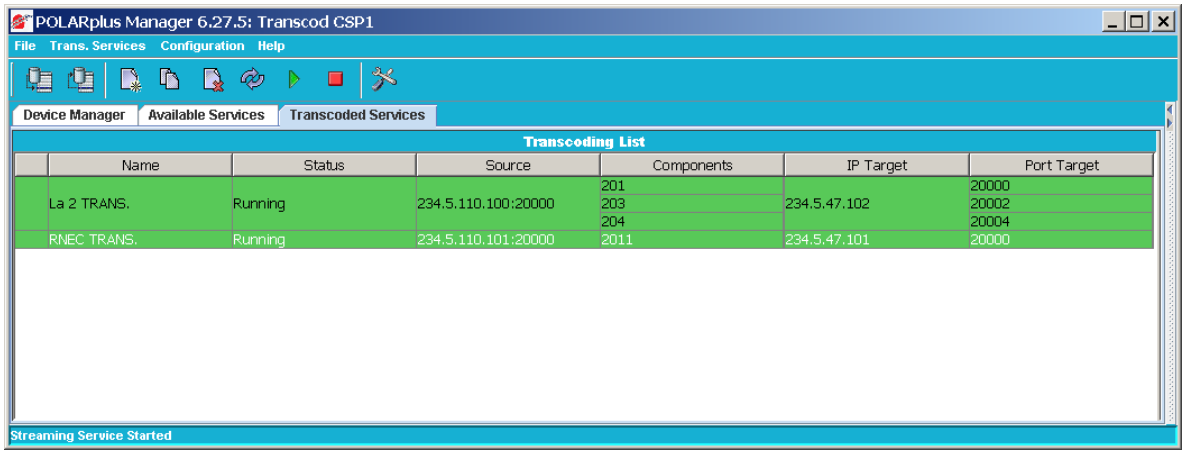

Once the transcoded service is started, it can be stopped by clicking on icon, or the menu option “Trans Services/Stop Transcoded Service”. If the service stop is successful the service status becomes to “stop” (red colour), information that can be observed in the “Transcoded Services” tab, and in the service list “Device Manager”.

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5 IP Multiplexers

POLARplus Manager is an application that allows the **search**, **monitoring** and **configuration** of the POLARplus devices grouped under the category of *IP Multiplexers*. Inside this category the following types of devices are found:

- **etherTV Mux**

- **vega Mux**

Using *POLARplus Manager* on these devices, we will be able to carry out some management tasks, as well as the configuration of the multiplexed transport streams.

The **management tasks** are:

- Device settings configuration. These settings are the name, network settings, querying status and TTL.
- Reading and writing of the device licence (only in case of vega Mux).
- Update of the firmware embedded on the device.
- Reset of the device, keeping its previous configuration.

The **configuration** of a device will consist basically in the configuration of the output transport stream (MPTS), resulting from multiplexing some input services, SPTS or MPTS encapsulated on IP streams. The main difference between **etherTV Mux** and **vega Mux** is the transport stream generated in the first case goes in ASI format whereas in the second case it goes encapsulated on a IP stream; but, there are important differences in performance and characteristics:

- The device etherTV Mux is only able to generate an output transport stream, whereas the vega Mux is able to generate various transport streams, everyone encapsulated on a different IP stream.
- The device etherTV Mux is able to generate an output transport stream with a bit rate about 23 Mbps, whereas the vega Mux device can reach until approximately 50 Mbps.
- The device etherTV Mux has restricted multicast support. In case of multicast addressing for input services, the multicast IP address must be the same for all input services, using the port value for differentiating themselves (values are consecutive and even).
- The etherTV Mux can not multiplex MPTS services with other services, whereas vega Mux can do it (it can add SPTS to a MPTS already configured).

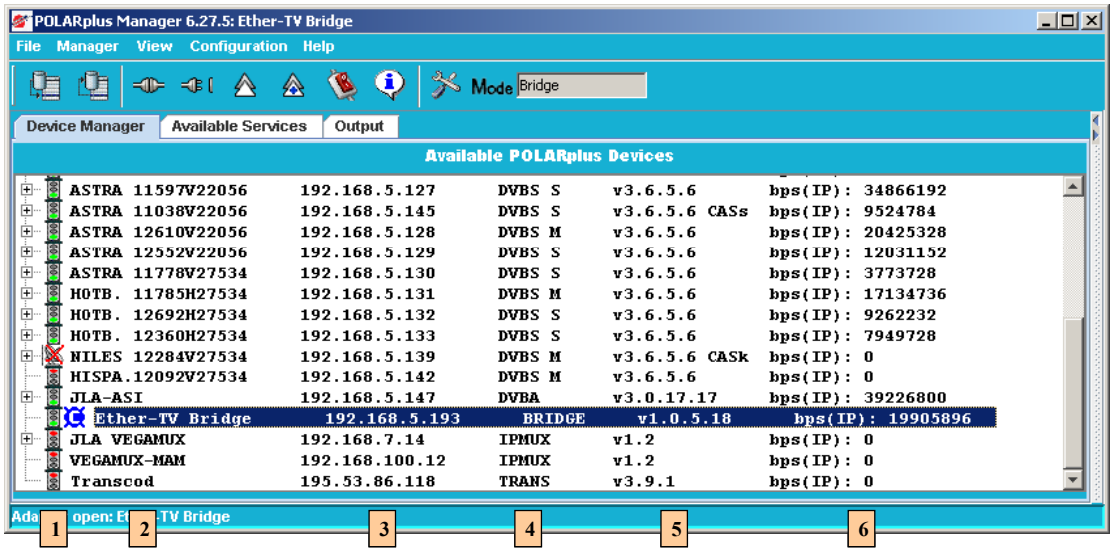
VEGAMUX IMPORTANT NOTES:

1. The Switch to where we connect the VegaMux MUST be in the same network than the VegaMux
2. The Switch Port to where we connect the VegaMux MUST have the Flow Control activated.

Searching devices

The search for the *IP Multiplexer* devices existing in the local network is automatic. The application continuously shows an updated list of devices in the local network, indicating their status. The *IP Multiplexer* devices present the text **EMUX** (etherTV Mux) or **IPMUX** (vega Mux) next to IP address.

This information is presented in “Device Manager” tab, and can be seen in the following figure.


POLARplus Manager 6.27.5: Ether-TV Bridge
File Manager View Configuration Help
Mode Bridge
Device Manager
Available Services
Output
Available POLARplus Devices
ASTRA 11597V22056 192.168.5.127 DVBS S v3.6.5.6 bps(IP): 34866192
ASTRA 11038V22056 192.168.5.145 DVBS S v3.6.5.6 CASs bps(IP): 9524784
ASTRA 12610V22056 192.168.5.128 DVBS M v3.6.5.6 bps(IP): 20425328
ASTRA 12552V22056 192.168.5.129 DVBS S v3.6.5.6 bps(IP): 12031152
ASTRA 11778V27534 192.168.5.130 DVBS S v3.6.5.6 bps(IP): 3773728
HOTB. 11785H27534 192.168.5.131 DVBS M v3.6.5.6 bps(IP): 17134736
HOTB. 12692H27534 192.168.5.132 DVBS S v3.6.5.6 bps(IP): 9262232
HOTB. 12360H27534 192.168.5.133 DVBS S v3.6.5.6 bps(IP): 7949728
NILES 12284V27534 192.168.5.139 DVBS M v3.6.5.6 CASk bps(IP): 0
HISPA.12092V27534 192.168.5.142 DVBS M v3.6.5.6 bps(IP): 0
JLA-ASI 192.168.5.147 DVBA v3.0.17.17 bps(IP): 39226800
Ether-TV Bridge 192.168.5.193 BRIDGE v1.0.5.18 bps(IP): 19905896
JLA VEGAMUX 192.168.7.14 IPMUX v1.2 bps(IP): 0
VEGAMUX-MAM 192.168.100.12 IPMUX v1.2 bps(IP): 0
Transcod 195.53.86.118 TRANS v3.9.1 bps(IP): 0
1
2
3
4
5
6

The information showed for every device is the following:

(1) Device Status. The meaning of the possible values is:

- Green light: the device is transmitting.
- Red light: the device is not transmitting because it is not configured.
- Yellow light: the device is only transmitting padding because it is not receiving any of the inputs that have been configured.
- No light: device without licence (only applied for vega Mux).
- No symbol (Board OFF): the device becomes not present (temporal status).
- Question mark: the device has been manually connected.

(2) Device Name.

(3) Device IP address.

(4) POLARplus device type, that in case of *IP Multiplexer* devices will be one of the following values:

- **EMUX**: etherTV Mux.
- **IPMUX**: vega Mux.

(5) Firmware version embedded on device.

(6) Bitrate (Bits/second) coming out from device (ASI output).

We can obtain more information about a given device selecting it with the mouse and using the right button to execute ‘**More Info**’ ( ). The additional information is in relation with the firmware version embedded on device.

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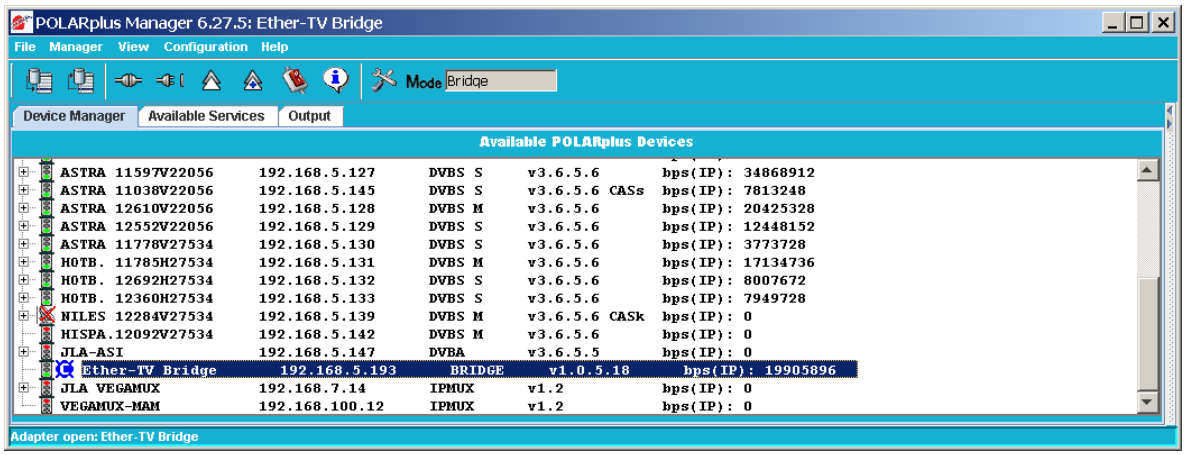
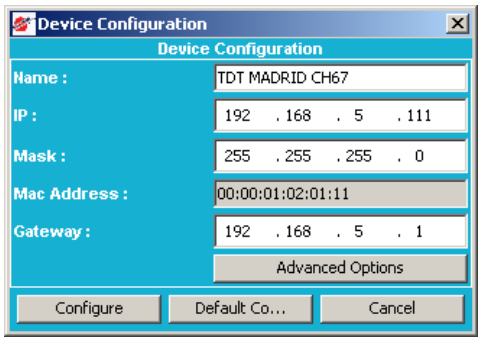
5.1 Management Tasks

The management commands are applied to the **selected** device (highlighted line), but not the “Set Mode” and “Device Settings” commands that are applied to the device **“connected”** (symbol **“C”**). In the following figure you can see that the selected device, and the device connected can be different ones. A selected device is done by a simple click on the desired device, and a device connected can be by three different ways: doing a double click on the device, or selecting the device (simple click) and either clicking on the icon ‘Connect’ ( ) or doing the menu option “Manager/Connect”.


POLARplus Manager 6.27.5: Ether-TV Bridge
File Manager View Configuration Help
Mode Bridge
Device Manager
Available Services
Output
Available POLARplus Devices
ASTRA 11597V22056 192.168.5.127 DVBS S v3.6.5.6 bps(IP): 34868912
ASTRA 11038V22056 192.168.5.145 DVBS S v3.6.5.6 CASs bps(IP): 7813248
ASTRA 12610V22056 192.168.5.128 DVBS M v3.6.5.6 bps(IP): 20425328
ASTRA 12552V22056 192.168.5.129 DVBS S v3.6.5.6 bps(IP): 12448152
ASTRA 11778V27534 192.168.5.130 DVBS S v3.6.5.6 bps(IP): 3773728
HOTB. 11785H27534 192.168.5.131 DVBS M v3.6.5.6 bps(IP): 17134736
HOTB. 12692H27534 192.168.5.132 DVBS S v3.6.5.6 bps(IP): 8007672
HOTB. 12360H27534 192.168.5.133 DVBS S v3.6.5.6 bps(IP): 7949728
NILES 12284V27534 192.168.5.139 DVBS M v3.6.5.6 CASk bps(IP): 0
HISPA.12092V27534 192.168.5.142 DVBS M v3.6.5.6 bps(IP): 0
JLA-ASI 192.168.5.147 DVBA v3.6.5.5 bps(IP): 0
Ether-TV Bridge 192.168.5.193 BRIDGE v1.0.5.18 bps(IP): 19905896
JLA VEGAMUX 192.168.7.14 IPMUX v1.2 bps(IP): 0
VEGAMUX-MAM 192.168.100.12 IPMUX v1.2 bps(IP): 0
Adapter open: Ether-TV Bridge

5.1.1 Configuration of the device parameters

We can configure the device parameters by clicking the menu option “Configuration/Device Settings” ( ). These parameters are: name (the default value is “EtherTV Mux” or ”Vega Mux”), network settings (IP address, net mask and gateway address), “querying” status and TTL value. These two last parameters are inside “Advanced Options”.



The “querying” status parameter is in relation with the multicasting management. Normally, the multicast traffic generated by these devices is distributed through routers and switches that must support IGMPv2. In these distribution networks there must be a “querier” that generates ‘IGMP query’ messages. This function is generally made by a router/switch, but if it is not present you can configure an only one device to perform this function. The port of the switch or router where this “querying” device is attached to, must support all the multicasting traffic existing in this switch/router. The “querying” status of the device can be displayed and modified in “Enable Querier” tick.

The TTL parameter value refers to the value of “Time To Live” field, in the streaming traffic generated from the device. When an IP packet comes in a router/switch, if its TTL is non zero, the packet will be propagated with the TTL decremented by 1. So, this value gives us an idea of the scope for the streaming traffic generated by these devices. The “querying” status and TTL value is configured through the following.

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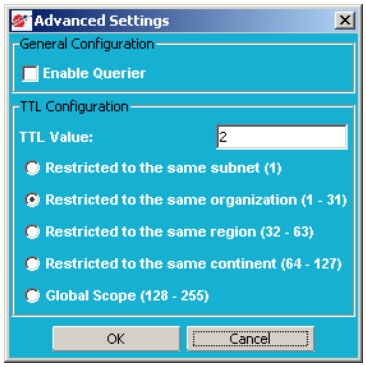

5.1.2 Firmware Update

The *POLARplus Manager* presents the option to update the firmware embedded in the selected device or in all devices existing in the local segment, by clicking the menu options “Manager/Upload” and “Manager/Upload ALL” (and respectively). In both cases, a dialog window comes up, inviting you to introduce the binary file to upload. Once the firmware update is finished, the device will be restarted.

5.1.3 Initialization

The menu option “Manager/Reset” allows initializing the selected device, leaving intact the current configuration including the input service previously configured.

5.1.4 Events Logging

There are two buttons (arrows) in the right border of the main window in order to maximize or minimize the logging window. This window contains a registration of all the events related to any change of the status in the devices or its associated services. Besides, it includes a registration of the commands executed from menu option “Manager”.

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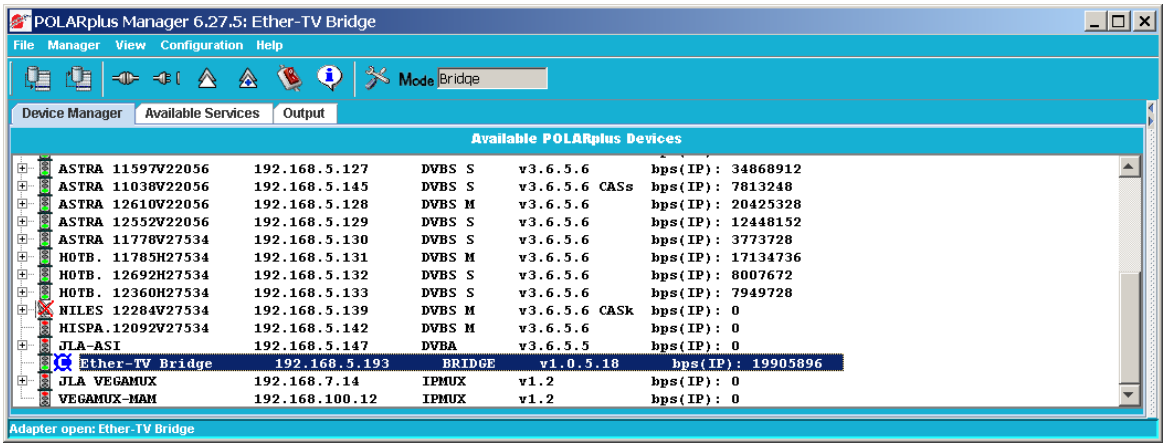
5.2 Configuration

The configuration of an *IP Multiplexer* device will consist in the following steps:

- Selection/Configuration of the input services.
- Configuration of the output multiplex.

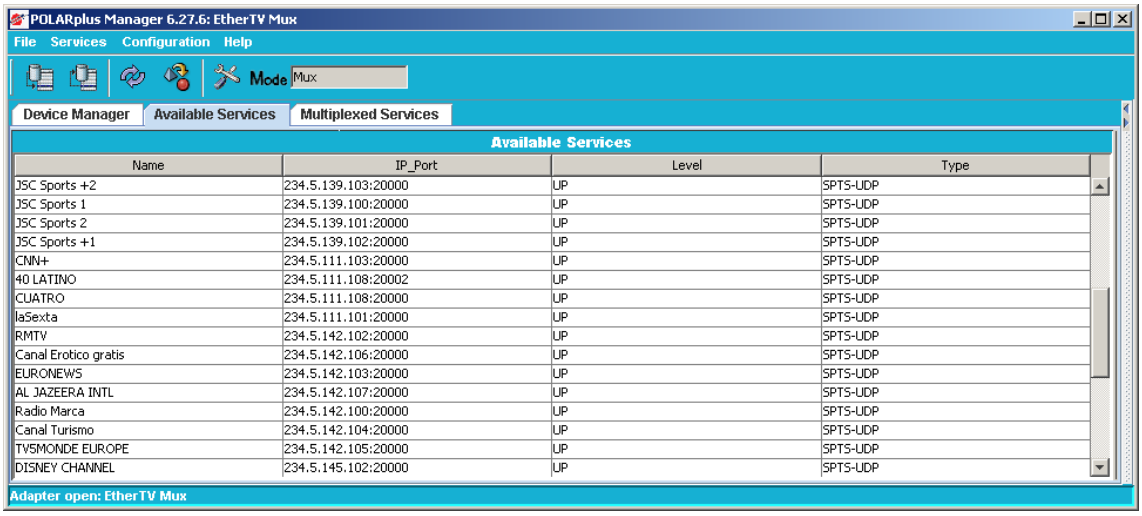
In order to configure a device, firstly we must **connect** it. We remind you that a board connected is set up by three different ways: doing a double click on the device, or selecting the device (simple click) and either clicking on the 'Connect' icon ( ), or doing the menu option "Manager/Connect".


POLARplus Manager 6.27.5: Ether-TV Bridge
File Manager View Configuration Help
Mode Bridge
Device Manager Available Services Output
Available POLARplus Devices
ASTRA 11597V22056 192.168.5.127 DVBS S v3.6.5.6 bps(IP): 34868912
ASTRA 11038V22056 192.168.5.145 DVBS S v3.6.5.6 CASs bps(IP): 7813248
ASTRA 12610V22056 192.168.5.128 DVBS M v3.6.5.6 bps(IP): 20425328
ASTRA 12552V22056 192.168.5.129 DVBS S v3.6.5.6 bps(IP): 12448152
ASTRA 11778V27534 192.168.5.130 DVBS S v3.6.5.6 bps(IP): 3773728
HOTB. 11785H27534 192.168.5.131 DVBS M v3.6.5.6 bps(IP): 17134736
HOTB. 12692H27534 192.168.5.132 DVBS S v3.6.5.6 bps(IP): 8007672
HOTB. 12360H27534 192.168.5.133 DVBS S v3.6.5.6 bps(IP): 7949728
NILES 12284V27534 192.168.5.139 DVBS M v3.6.5.6 CASk bps(IP): 0
HISPA.12092V27534 192.168.5.142 DVBS M v3.6.5.6 bps(IP): 0
JLA-ASI 192.168.5.147 DVBA v3.6.5.5 bps(IP): 0
Ether-TV Bridge 192.168.5.193 BRIDGE v1.0.5.18 bps(IP): 19905896
JLA VEGAMUX 192.168.7.14 IPMUX v1.2 bps(IP): 0
VEGAMUX-MAM 192.168.100.12 IPMUX v1.2 bps(IP): 0
Adapter open: Ether-TV Bridge

We can configure a device not listed (the application couldn't detect it), if we know that it is available (check by a **ping** to the IP address using a command console) and we know its IP address. We have to click in the menu option "Manager/Manual connection". If the application achieves to connect the device, this will be added to the list with an unknown state (?).

5.2.1 Selection/Configuration of the input services

In order to select or define these services, we can start from the "Available Services" where the application shows up all SPTS services originated from POLARplus devices in the local network. From this list, we can select the SPTS services to multiplex clicking on the menu option "Services/Multiplex Selected Services" or clicking on the icon. The services will be passed to the "Multiplexed Services" tab.


POLARplus Manager 6.27.6: EtherTV Mux
File Services Configuration Help
Mode Mux
Device Manager Available Services Multiplexed Services
Available Services
Name IP_Port Level Type
JSC Sports +2 234.5.139.103:20000 UP SPTS-UDP
JSC Sports 1 234.5.139.100:20000 UP SPTS-UDP
JSC Sports 2 234.5.139.101:20000 UP SPTS-UDP
JSC Sports +1 234.5.139.102:20000 UP SPTS-UDP
CNN+ 234.5.111.103:20000 UP SPTS-UDP
40 LATINO 234.5.111.108:20002 UP SPTS-UDP
CUATRO 234.5.111.108:20000 UP SPTS-UDP
laSexta 234.5.111.101:20000 UP SPTS-UDP
RMTV 234.5.142.102:20000 UP SPTS-UDP
Canal Erotico gratis 234.5.142.106:20000 UP SPTS-UDP
EURONEWS 234.5.142.103:20000 UP SPTS-UDP
AL JAZEERA INTL 234.5.142.107:20000 UP SPTS-UDP
Radio Marca 234.5.142.100:20000 UP SPTS-UDP
Canal Turismo 234.5.142.104:20000 UP SPTS-UDP
TV5MONDE EUROPE 234.5.142.105:20000 UP SPTS-UDP
DISNEY CHANNEL 234.5.145.102:20000 UP SPTS-UDP
Adapter open: EtherTV Mux

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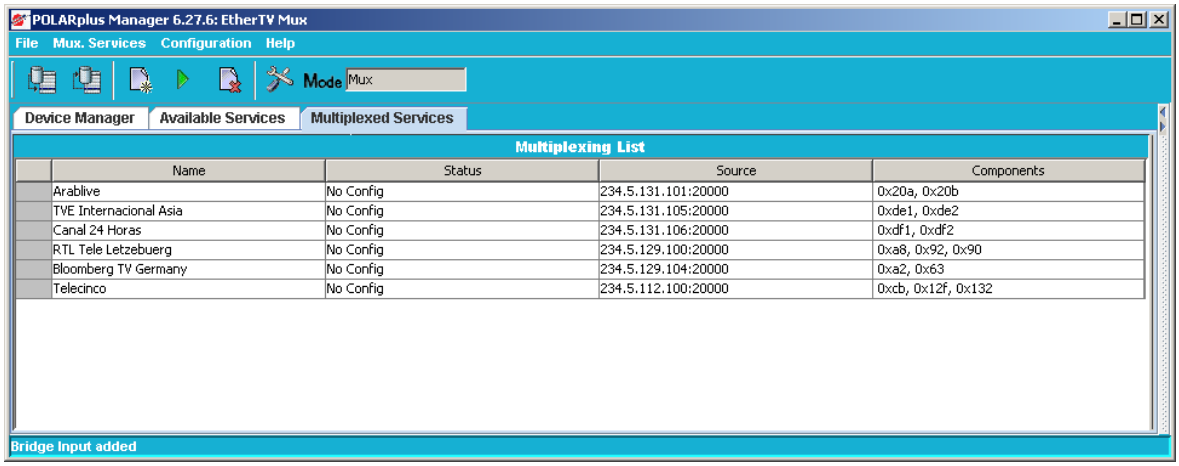
In case of configuring vega Mux, the MPTS services are also showed in the list because they can be multiplexed.



In case of a input service comes from a device different from a POLARplus device, so it is not in the "Available Services" list, it can be configured from "Multiplexed Services" tab by menu option "Mux.Services/Add New Input Service" ( ). Then, the application will invite us to introduce the input streaming parameters: IP address and port. In case of EtherTV Mux device, there is a constraint very important about IP address and port of the input services: all these services must have the same multicast IP address and ports even and consecutive.

At any moment, we can delete the output configured for the device by clicking on either the menu option "Mux. Services/Delete Multiplexed Services", or icon.

5.2.2 Configuration of the output multiplex (etherTV Mux & vega Mux)

On the vega Mux device, the resulting multiplex or multiplexes are encapsulated in IP streams using UDP or RTP protocols. On the EtherTvMux we will have an ASI output or OFDM if we have this option. This configuration is accessible with a double click on the service or using the menu option "Multiplexed Services / Modify Multiplexed Service" with the service stopped, and it can be split in the following steps:

5.2.2.1 Inputs Configuration

In this step we can delete some of the PIDs associated to every input service and we can add "ghost components". These components are not contained into service information associated to the service.

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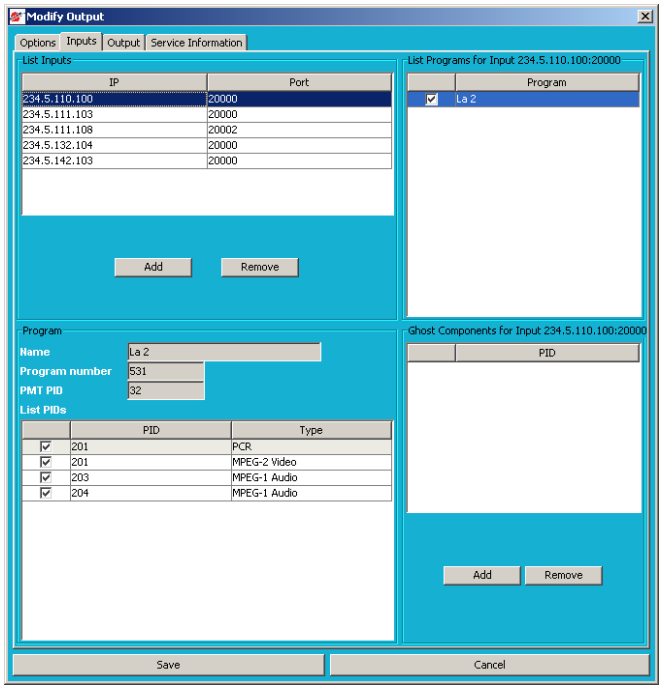
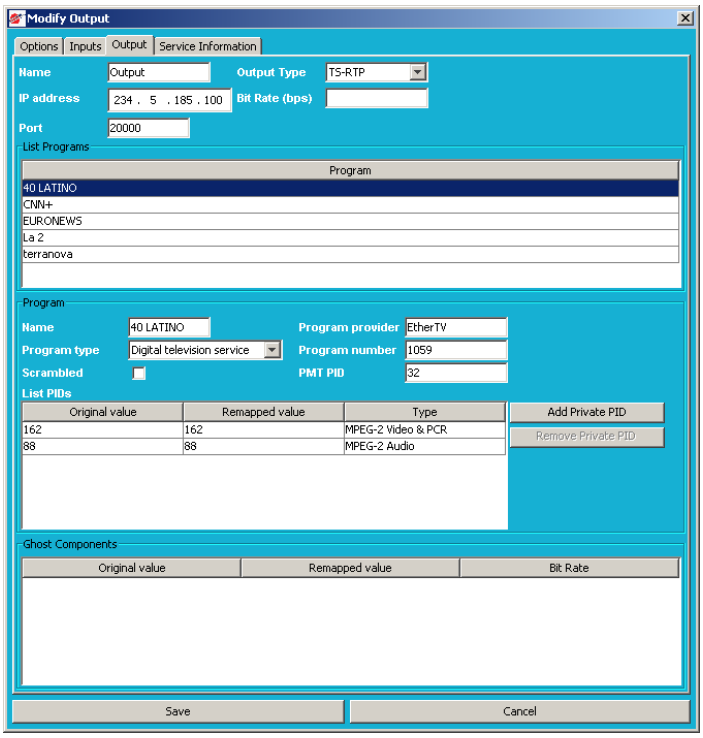


5.2.2.2 Output Configuration

In this step, we configure output parameters as the MPTS name, IP address / port of the stream where it is going to be encapsulated, the encapsulation protocol (UDP or RTP) and output bitrate. The bitrate must be a value greater than the sum of all service bitrates that makes up the multiplex.



Moreover, we can change information of every program in the output multiplex from the original values, as name, provider, program number, PID values (remapping), and we can add private PIDs in the service information associated to the program.

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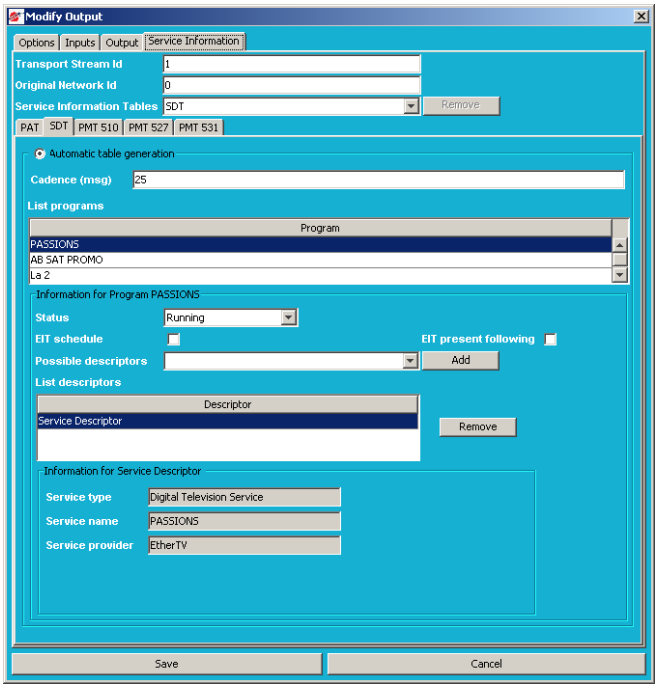
NOTE: It is very important that in the output multiplex there will not be duplicated program numbers or PMT PIDs of different programs; if the input services have any of these values repeated, the conflict can be resolved in this configuration step assigning different values. In case of the input services are SPTS and come from EtherTV boards, the PMT PID has the same value in all of them (32), so in order to be multiplexed it is necessary to change this value for every one. In this way, we avoid duplicated values for PMTs.

5.2.2.3 Service Information Configuration

In this step we can configure the service information corresponding to the output multiplex. By default, the service information generated is PAT (Program Association Table), TDT (Time and Date Table), SDT (Service Description Table) and PMT (Program Map Table) for every service at the output. Moreover, we can add other tables as external contributions, configuring the IP address and port where this information comes. In this way, for instance, we can add into the output multiplex the EIT that is generated from an EPG (Electronic Program Guide) device.

In the configuration of the tables generated automatically, we can configure the transmitting cadence.



Moreover in the case of SDT and PMT tables for every program, we can add descriptors; in case of SDT, descriptors can be added associated to the program, whereas in case of PMT, descriptors can be added associated to the program and to a given component, as we can see in the next figure:

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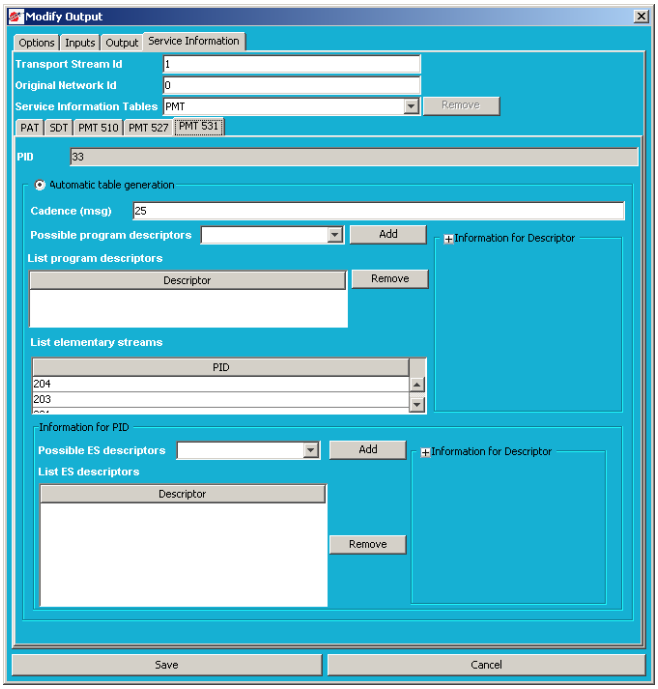

To add new table, first it has to be selected the table in “Service Information Tables” and then click “Add” button. It could be deleted selecting the table and clicking “Remove” button.

The non-by-default tables to be added are:

- BAT (Bouquet Association Table)
- CAT (Condicional Access Table)
- CIT (Content Identifier Table)
- DIT (Discontinuity Information Table)
- EIT (Event Information Table)
- NIT (Network Information Table)
- RST (Running Status Table)
- SIT (Selection Information Table)
- TOT (Time Offset Table)
- TSDT (Trnasport stream Description Table)

These tables could obtain the content form external sources:

But there are some exceptions like EIT, NIT and CAT. EIT allows also to use the contributions obtained by the DVB-IP Gategway. It is mandatory to have a *Deluxe* Gateway (ver 2) and a PolarPlus Manager version 7.2 or upper.

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In the case of NIT, it is possible to fill it locally with the following parameters:

- Cadente in miliseconds.
- Network Id
- Posible Network Descriptors
  - Linkage Descriptor
  - Multilingual Network Name Descriptor
  - Network Name Descriptor
- Posible TS Descriptors
  - Cable Delivery System Descriptor
  - Cell Frequency System Descriptor
  - Cell List Descriptor
  - Default Authority Descriptor
  - Frequency List Descriptor
  - Logical Channel Descriptor
  - Private Data Specifier Descriptor
  - Satellite Delivery system Descriptor
  - Service List Descriptor
  - Stuffing Descriptor
  - Terrestrial Delivery System Descriptor
  - Time Slice and FEC Identifier Descriptor

To add the descriptors listed above, choose the descriptor form the drop down list and then press “Add”. To delete, select the descriptor and then press “Remove”.

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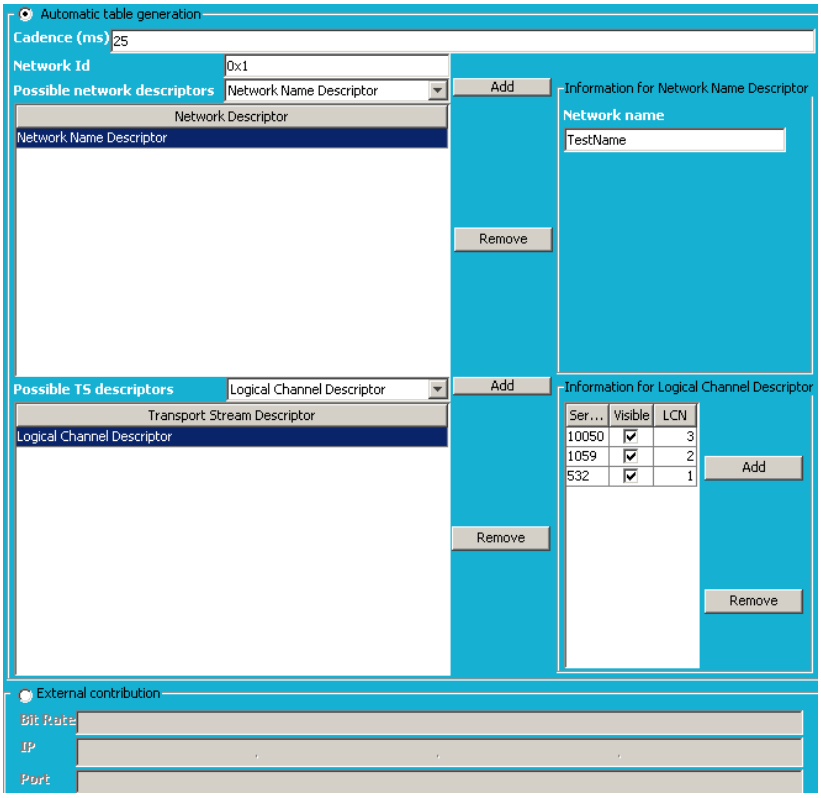

See the next chapter 5.2.4 for CAT configuration. Once the configuration has been completed, we save it by “Save” button, and we can proceed to start the transmission by clicking on the icon , or by the menu option “Multiplexed Services/Start Multiplexing”.

5.2.3 OFDM Output (etherTv Mux + OFDM)

In this step is where we configure the OFDM output. The modulation parameters will be determined automatically by the bitrate configured in the Output tab

Here, we will be able to determine the output power (50 - 70 dBµV), the region where the equipment will be installed and the channel (for Europe no UK from 35 to 69), these two parameters will automatically determine frequency, bandwidth and Mode.

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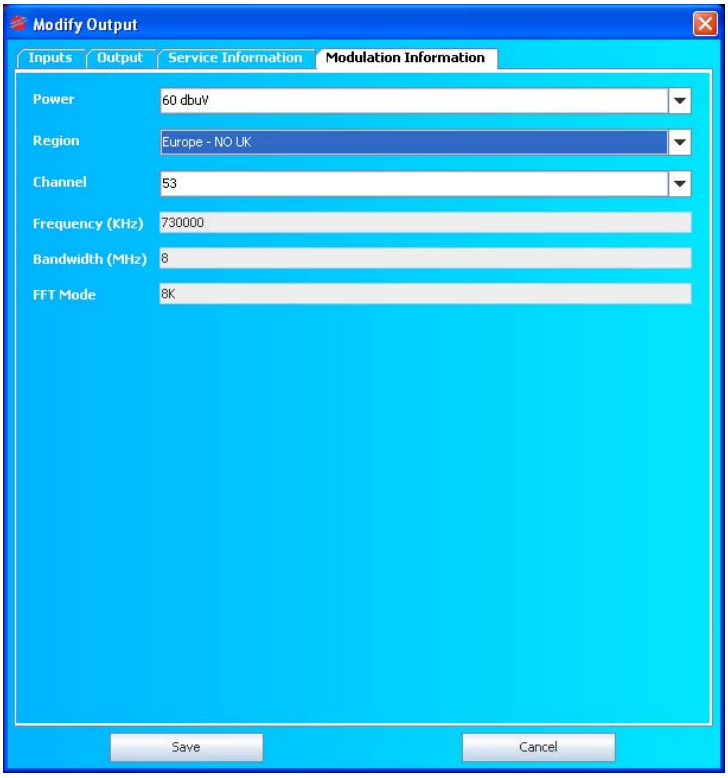
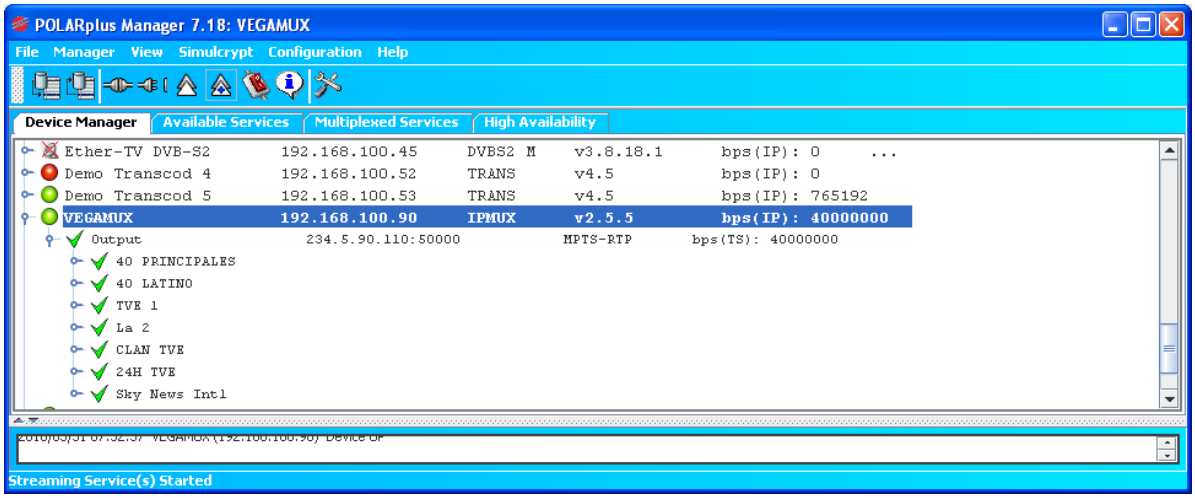


5.2.4 Conditional Acess Configuration (Vega Mux)

The Conditional Access configuration steps are detailed next. This configuration is valid for any Symulcript system.

1.- Select and connect to the VEGAMUX.



2.- Add the inputs to be made up in the VEGAMUX, please refer to chapter 3.2. The encryption part will be explained in the following chapters.

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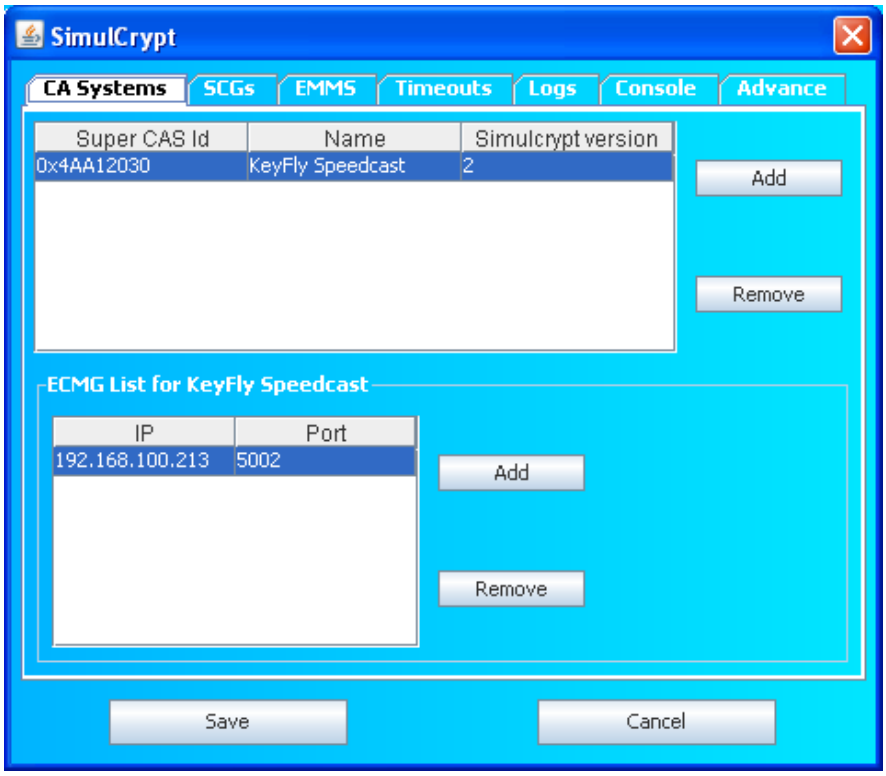
5.2.4.1 SimulCrypt Configuration

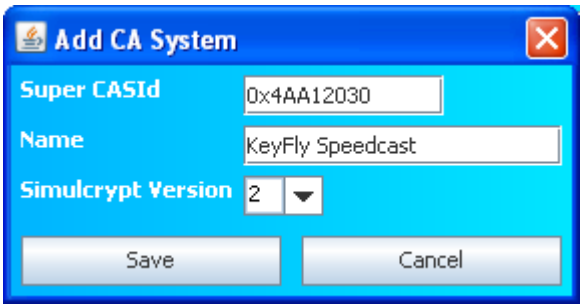
Once we are connected to the VegaMux, we can select the SymulCrypt tab in order to configure this part.

CA Systems



In this part, we can configure our CAS providers SuperCasID, name and Simulcrypt Version (at this moment, only version 2 is available).

By pressing the “Add” button, we can add as many CAS providers as we have.



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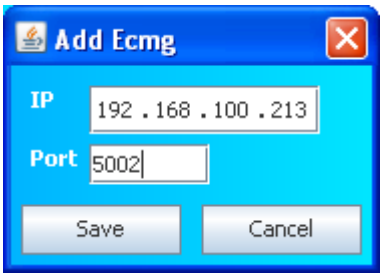
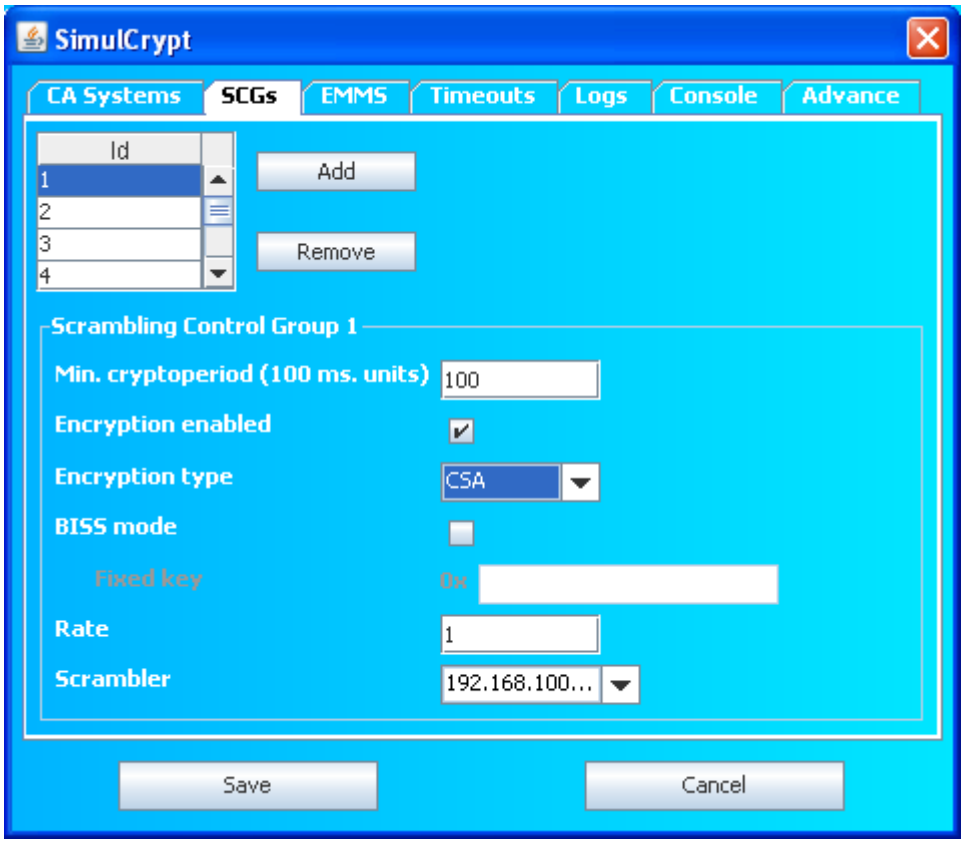
In the ECMG list, we will configure the IP and port of the ECMG, we can add additional ones in case we have redundancy, this lists, are specific for each provider, that means, we will have a different list for each SuperCasId.



SCGs (Scrambling Control Group)

We have to add a SCG for each service to be encrypted, later on, in the Service part, we will associate the services with the SCG generated here.



For each SCG, we can:

- Select its minimum cryptoperiod (in steps of 100 ms)
- Enable / Disable encryption
- Select the encryption type (VegaMux uses CSA)

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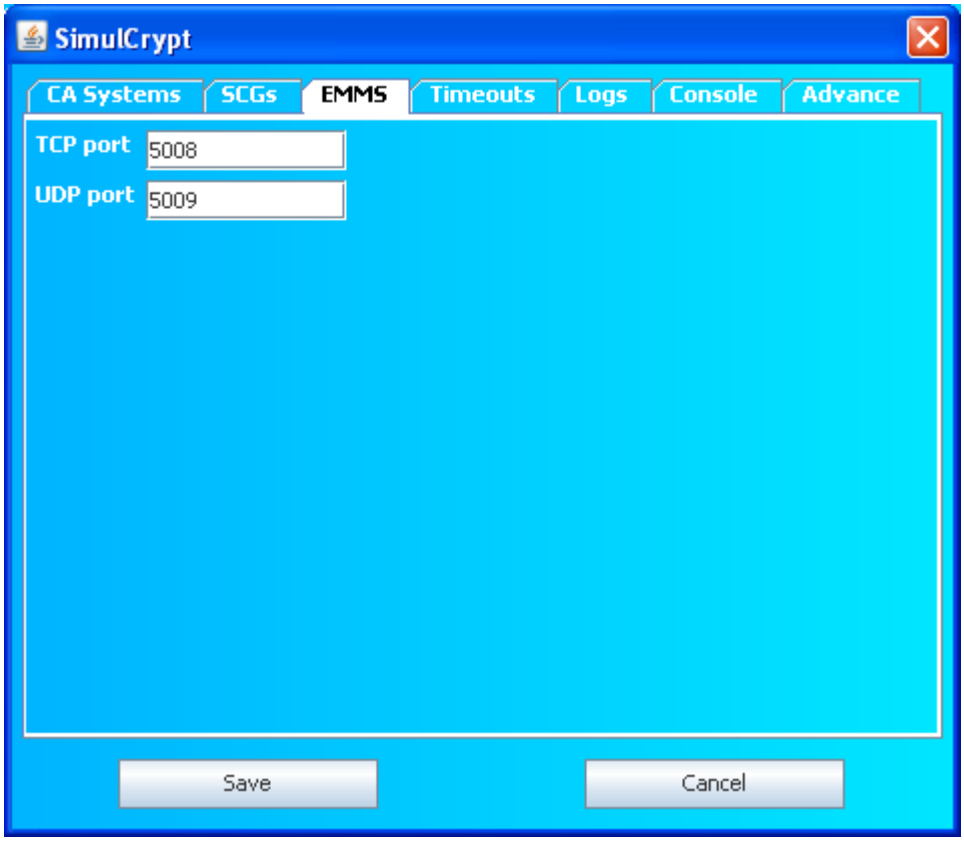
- BISS Mode: in case we do not have a CAS system, we can encrypt the services with a BISS code
- Rate, we can select whether to encrypt all of the packets or just part of them, the value range goes from 1 (all packets will be encrypted) to 10 (for every 10 packets only 1 will be encrypted).

EMMs

Here, we will configure the ports where we will be “listening” the EMMG, we can configure this parameter for TCP and UDP, a value has to be added, if we are not going to use any of the protocols, that value should be settled to “0”



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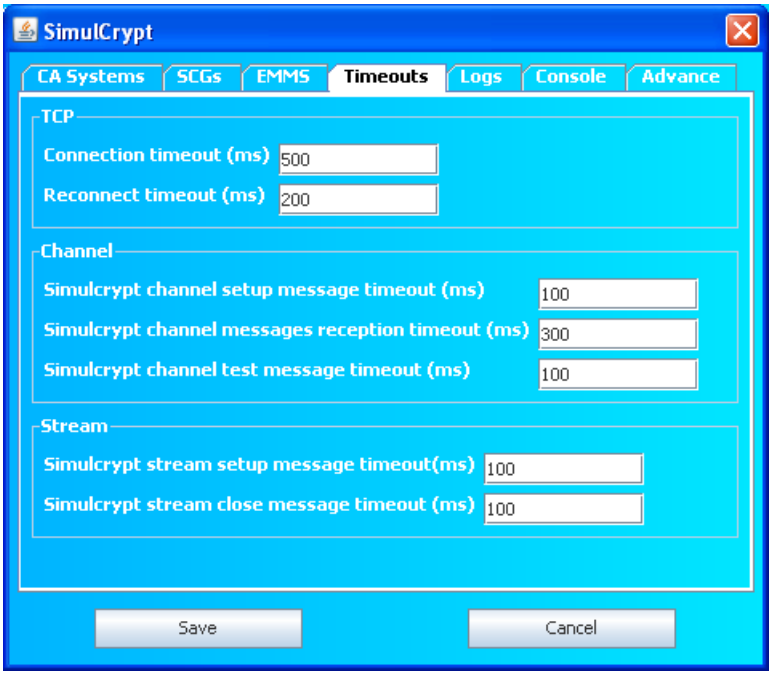
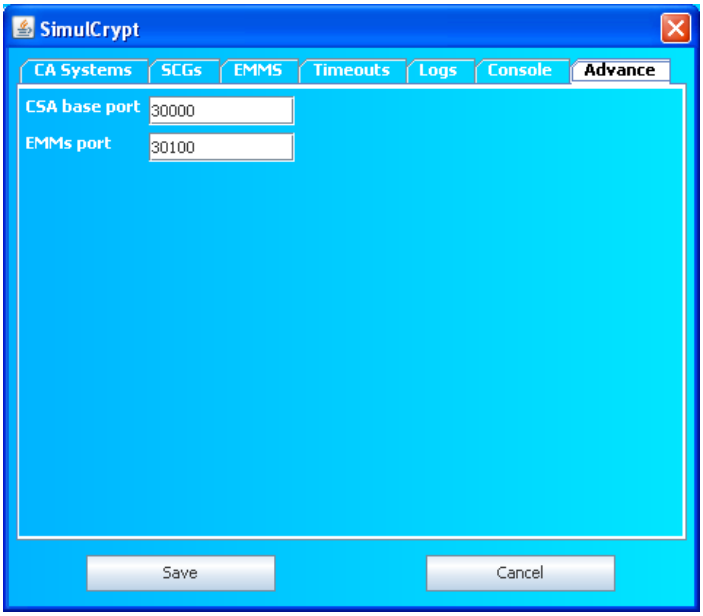
TimeOuts

It is recommended to leave this parameters in the default value, this values are the recommended in the SymulCrypt specs.



Advanced

This ports are used internally by the VegaMux, please be sure that there is no incoming traffic through this ports.



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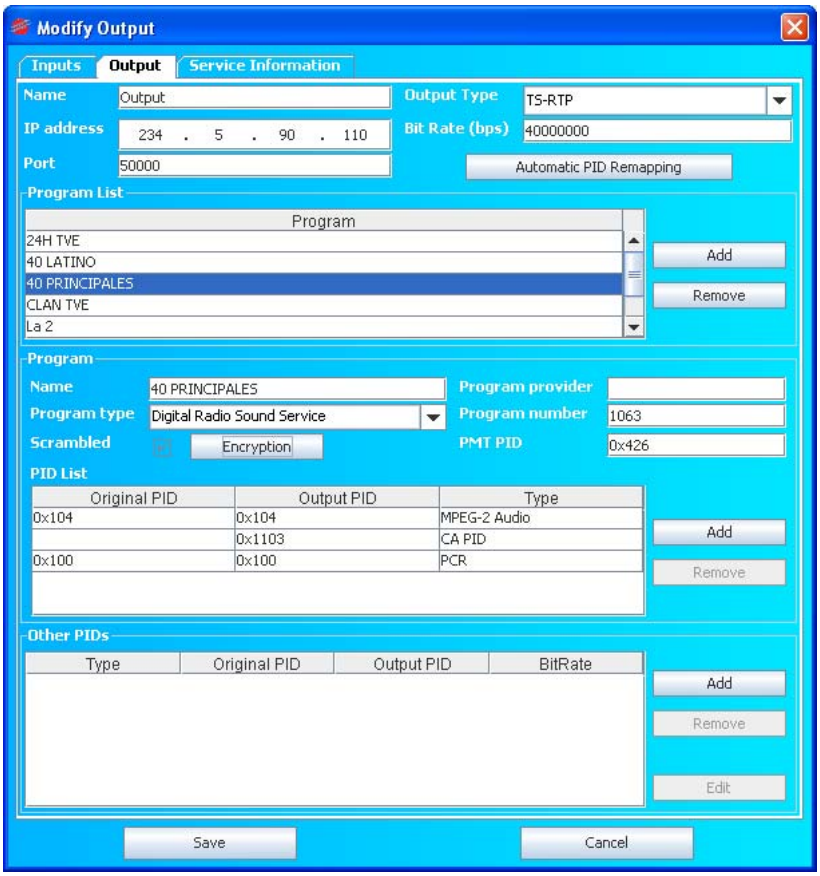
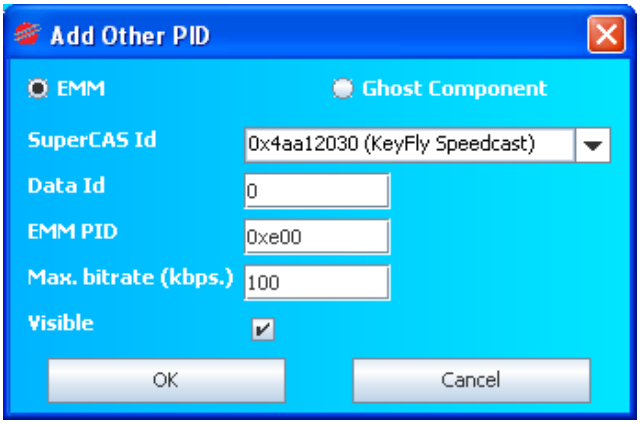
5.2.4.2 CSA Configuration

Once we have configured all the VegaMux's inputs and have configured the SymulCrypt part, it is time to scramble the services.



We have to add the EMM (Entitlement Management Messages) traffic input as "Other PIDs"



If "Visible" activated, CAT table will be automatically generated.

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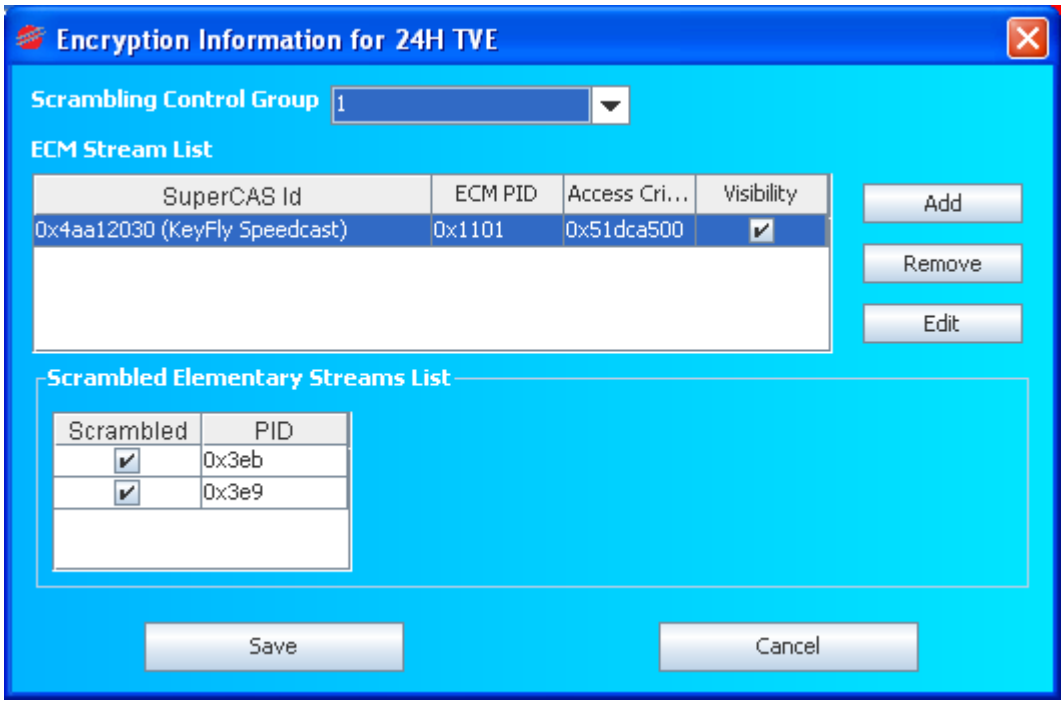
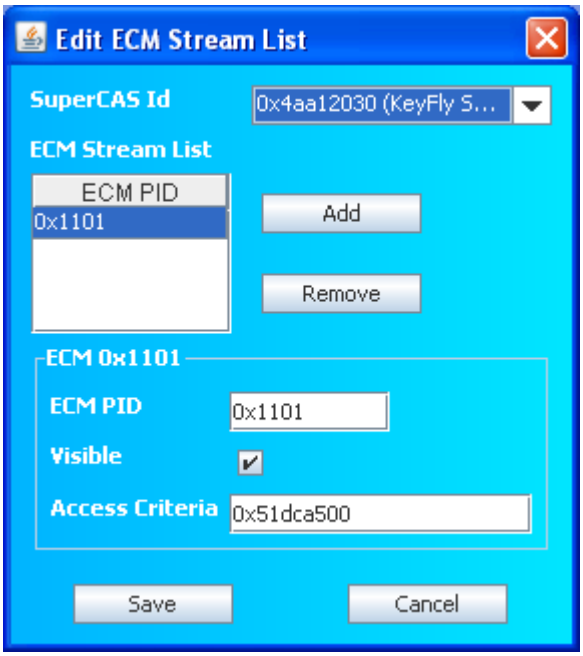
Select the service to be encrypted in the output tab and press the “encryption” button in order to add the private PIDs of each conditional access system ECM (Entitlement Control Messages).

In this part is where we will associate the SCG created previously (SymulCrypt part) to each service.

We can decide which PIDs will be scrambled.





If “Visible” active, CA Descriptor will be automatically added to the PMT.

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6 Distribution

POLARplus Manager is an application that allows the **search**, **monitoring** and **configuration** of the POLARplus devices grouped under the category of *Distribution Devices*. Inside this category the following type of devices are found:

- **Orion Encapsulator**

- **Orion Receiver**

All the explanations showed in this chapter apply on this type of devices, and from now to chapter end they will be referred as “devices”.

Using *POLARplus Manager* on these devices, we will be able to carry out some management tasks, as well as the configuration of the encapsulation/reception operation.

The **management tasks** are:

- Device settings configuration. These settings are the name, network settings and querying status.
- Update of the firmware embedded on the device.
- Reset of the device, keeping its previous configuration.
- Suspend and resume the distribution operation.

ORION ENCAPSULATOR is designed for satellite contribution and distribution networks. It is completely suitable for distributing multiple transport streams via satellite from the headend to multiple remote sites. It can also be used for IP streams distribution over DVB Networks. It is used in conjunction with ORION RECEIVER at the remote sites.

ORION RECEIVER is a satellite and IP receiver specialized in contribution and distribution DVB networks in which TS or IP streams are carried from a headend to many remote sites via satellite IP links.

The contents encapsulated can be encrypted with any simulcrypt standard CAS of your choice including KEYFLY CDN, providing limited access to the contents for different possible subscribers. It is also possible to use BISS, based on fixed-key, to provide encryption with no need for extra payload (CAT, ECMS, EMMS, …).

The **configuration** of an ORION ENCAPSULATOR device will consist basically in the election of the operation mode as well as of the services or programs that the device will serve to the network in format of "transport stream" encapsulated in IP, using multicast or unicast addresses. Then encrypt the encapsulated services applying BISS or configure SymulCrypt.

The **configuration** of an ORION RECEIVER device will consist in tuning the transponder, decrypt the encapsulated streams and obtain the encapsulated services. These services must be in the same transponder, because a device, in a given moment, only can tune in a single transponder.

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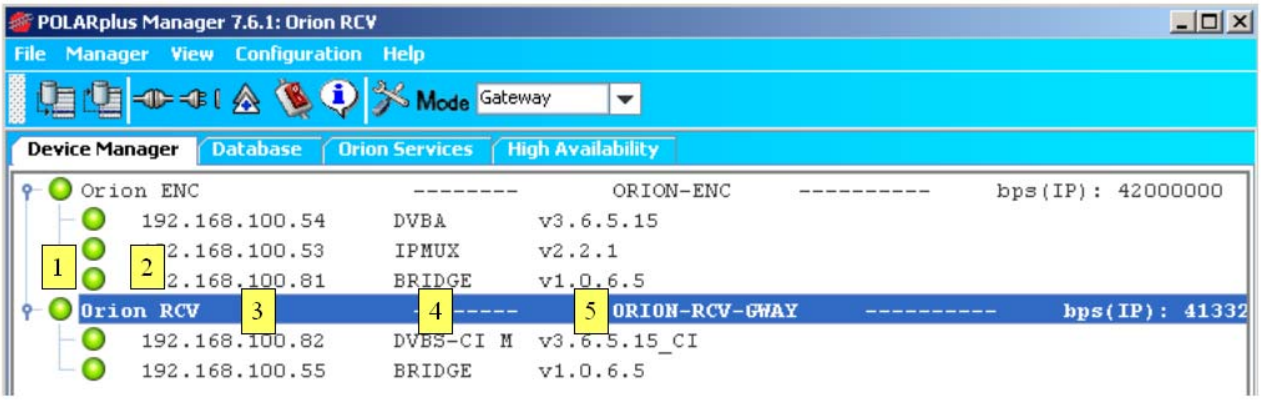
6.1 Searching devices

The search for the *ORION Encapsulator / Receiver* existing in the local network is automatic. The application continuously shows an updated list of devices in the local network, indicating their status. *ORION Encapsulator / Receiver* devices present the text **ORION ENC** and **ORION RCV** respectively.

This information is presented in “Device Manager” tab, and can be seen in the following figure.



The information showed for every device is the following:

(1) Device Status. The meaning of the possible values is:

- Green light: the device is encapsulated/received to the output what is incoming according to the excluded PIDs list.
- Red light: the device is not encapsulated/received. The device is suspended.
- No symbol (Board OFF): the device becomes not present (temporal status).

(2) Device Name.

(3) Device IP address.

(4) POLARplus device type, which in case of *ORION Encapsulator / Receiver* devices will be one of the following values:

- **ORION ENC**: ORION Encapsulator.
- **ORION RCV**: ORION Receiver.

(5) Firmware version embedded on device.

We can obtain more information about a given device selecting it with the mouse and using the right button to execute ‘**More Info**’ ( ). The additional information is in relation with the firmware version embedded on device.

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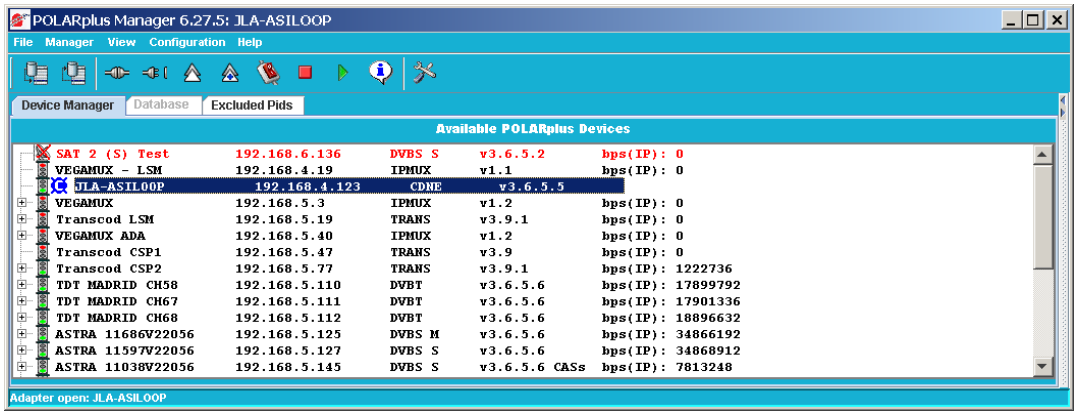
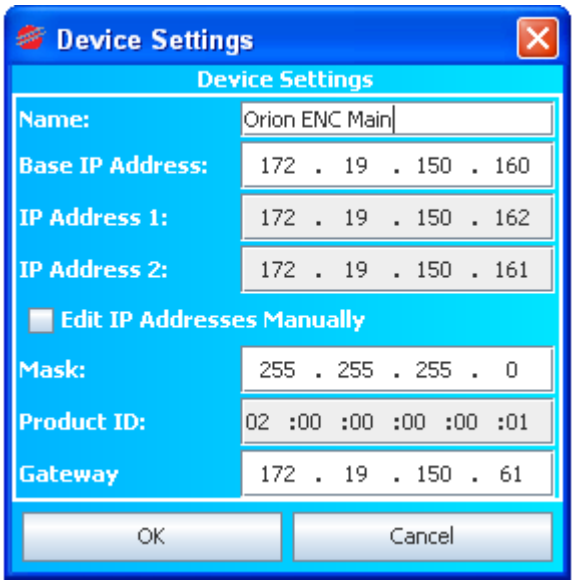
6.2 Management Tasks

The management commands are applied to the **selected** device (highlighted line), but not the “Set Mode” and “Device Settings” commands that are applied to the device **“connected”** (symbol **“C”** or **highlighted** for PpM Deluxe version). In the following figure you can see that the selected device, and the device connected can be different ones. A selected device is done by a simple click on the desired device, and a device connected can be by three different ways: doing a double click on the device, or selecting the device (simple click) and either clicking the ‘Connect’ icon ( ), or doing the menu option “Manager/Connect”.


POLARplus Manager 6.27.5: JLA-ASILOOP
File Manager View Configuration Help
Device Manager
Database
Excluded Pids
Available POLARplus Devices
SAT 2 (S) Test 192.168.6.136 DVBS S v3.6.5.2 bps(IP): 0
VEGAMUX - LSM 192.168.4.19 IPMUX v1.1 bps(IP): 0
JLA-ASILOOP 192.168.4.123 CDNE v3.6.5.5
VEGAMUX 192.168.5.3 IPMUX v1.2 bps(IP): 0
Transcod LSM 192.168.5.19 TRANS v3.9.1 bps(IP): 0
VEGAMUX ADA 192.168.5.40 IPMUX v1.2 bps(IP): 0
Transcod CSP1 192.168.5.47 TRANS v3.9 bps(IP): 0
Transcod CSP2 192.168.5.77 TRANS v3.9.1 bps(IP): 1222736
TDT MADRID CH58 192.168.5.110 DVBT v3.6.5.6 bps(IP): 17899792
TDT MADRID CH67 192.168.5.111 DVBT v3.6.5.6 bps(IP): 17901336
TDT MADRID CH68 192.168.5.112 DVBT v3.6.5.6 bps(IP): 18896632
ASTRA 11686V22056 192.168.5.125 DVBS M v3.6.5.6 bps(IP): 34866192
ASTRA 11597V22056 192.168.5.127 DVBS S v3.6.5.6 bps(IP): 34868912
ASTRA 11038V22056 192.168.5.145 DVBS S v3.6.5.6 CASs bps(IP): 7813248
Adapter open: JLA-ASILOOP

6.2.1 Configuration of the device parameters

We can configure the device parameters by clicking the menu option “Configuration/Device Settings” ( ). These parameters are: name (the default value is “Ether-TV”), network settings (IP address, net mask and gateway address) and “querying” status. This last parameter is inside “Advanced Options”.



Warning: All devices must be in same network

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6.2.2 Firmware Update

The *POLARplus Manager* presents the option to update the firmware embedded in the selected device or in all devices existing in the local segment, by clicking the menu options “Manager/Upload” and “Manager/Upload ALL” (and respectively). In both cases, a dialog window comes up, inviting you to introduce the binary file to upload. Once the firmware update is finished, the device will be restarted.

6.2.3 Initialization

The menu option “Manager/Reset” allows initializing the selected device, leaving intact the current configuration.

6.2.4 Suspend and Resume

The menu options “Manager/Suspend”, “Manager/Resume”, “Manager/Suspend ALL”, and “Manager/Resume ALL”, allows suspending or resuming the selected device or all existing devices in the local network (and respectively in the icon bar).

The device suspension implies that the device stops encrypting/decrypting, so the output transport stream will be exactly the same than the input one. As a consequence of suspension, the traffic light of the device will change to red.

When we resume the device, the device will return to encrypt/decrypt and the traffic light will become green.

A device initialization caused by either a hardware reset or a command from the application (Upload and Reset), implies a resume of the all suspended services.

6.2.5 Events Logging

There are two buttons (arrows) in the right border of the main window in order to maximize or minimize the logging window. This window contains a registration of all the events related to any change of the status in the devices or its associated services. Besides, it includes a registration of the commands executed from menu option “Manager”.

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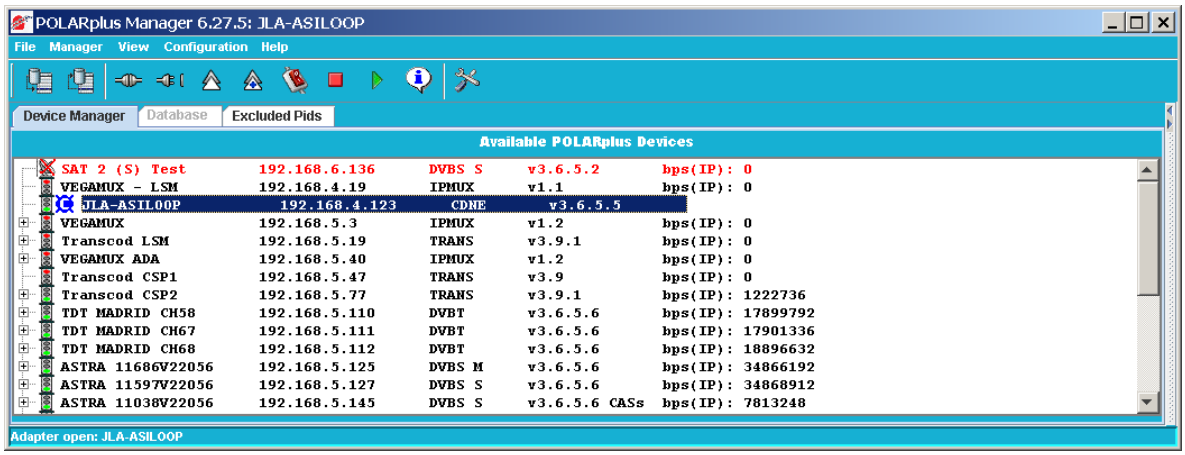
6.3 Configuration

In order to configure a device, firstly we must **connect** it. We remind you that a board connected is set up by three different ways: doing a double click on the device, or selecting the device (simple click) and either clicking the 'Connect' icon, or doing the menu option "Manager/Connect".

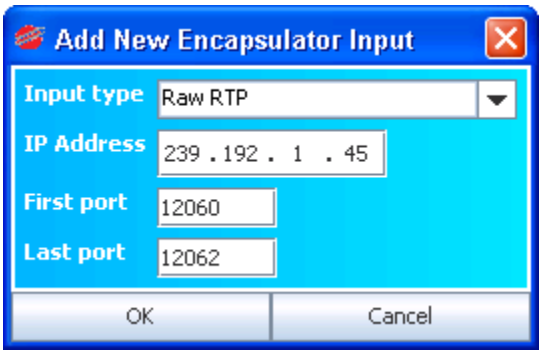

POLARplus Manager 6.27.5: JLA-ASILOOP
File Manager View Configuration Help
Device Manager
Database
Excluded Pids
Available POLARplus Devices
SAT 2 (S) Test 192.168.6.136 DVBS S v3.6.5.2 bps(IP): 0
VEGAMUX - LSM 192.168.4.19 IPMUX v1.1 bps(IP): 0
JLA-ASILOOP 192.168.4.123 CDNE v3.6.5.5
VEGAMUX 192.168.5.3 IPMUX v1.2 bps(IP): 0
Transcod LSM 192.168.5.19 TRANS v3.9.1 bps(IP): 0
VEGAMUX ADA 192.168.5.40 IPMUX v1.2 bps(IP): 0
Transcod CSP1 192.168.5.47 TRANS v3.9 bps(IP): 0
Transcod CSP2 192.168.5.77 TRANS v3.9.1 bps(IP): 1222736
TDT MADRID CH58 192.168.5.110 DVBT v3.6.5.6 bps(IP): 17899792
TDT MADRID CH67 192.168.5.111 DVBT v3.6.5.6 bps(IP): 17901336
TDT MADRID CH68 192.168.5.112 DVBT v3.6.5.6 bps(IP): 18896632
ASTRA 11686V22056 192.168.5.125 DVBS M v3.6.5.6 bps(IP): 34866192
ASTRA 11597V22056 192.168.5.127 DVBS S v3.6.5.6 bps(IP): 34868912
ASTRA 11038V22056 192.168.5.145 DVBS S v3.6.5.6 CASs bps(IP): 7813248
Adapter open: JLA-ASILOOP

We can configure a device not listed (the application couldn't detect it), if we know that it is available (check by a **ping** to the IP address using a command console) and we know its IP address. We have to click in the menu option "Manager/Manual connection". If the application achieves to connect the device, this will be added to the list with an unknown state (?).

6.3.1 Configuration of the encapsulation/encryption operation

The first step is to connect to the ORION Encapsulator. As we have said before, by default this device encapsulates/encrypts the incoming sercives. The configuration of this device basically consists of electing the input flows.

The add of a new input to the encapsulator it could be used the "add New Encapsulator Input" menu option or click in as it is shown in the next figure:



Selecting a port range (First port to Last port), the correlative ports will be added. When you click on "OK" button, the encapsulation operation will be updated according the new list.

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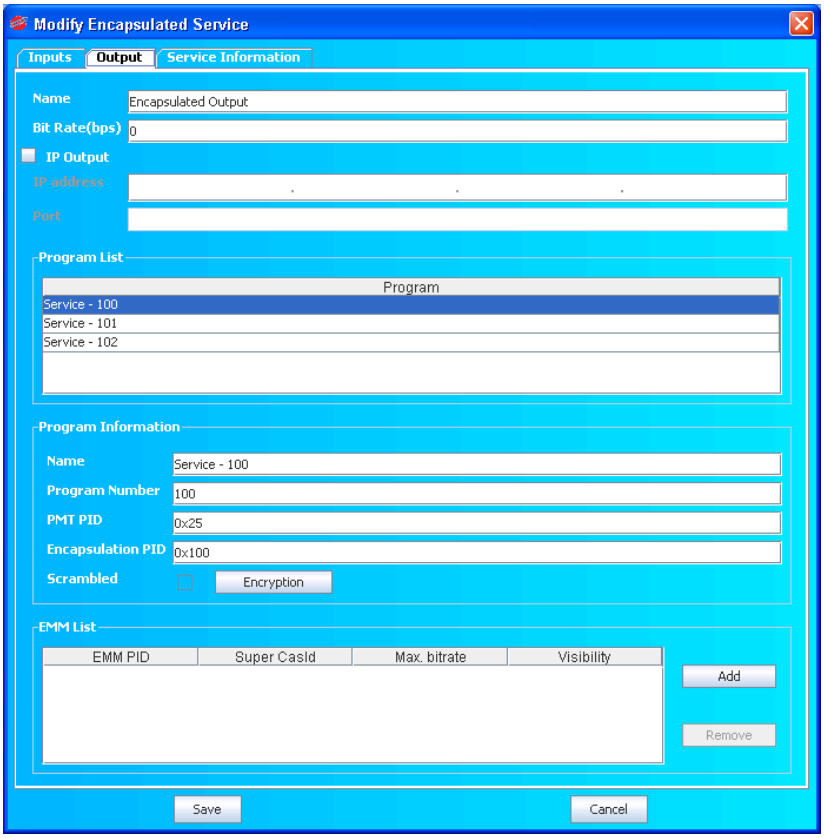
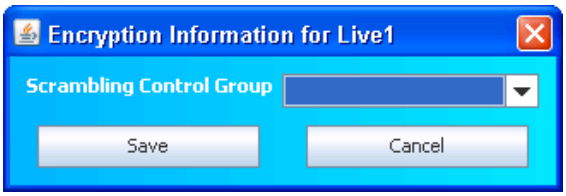
Once the services have been added it is possible to modify the different parameters (Name, Program number, PMT PID and Encapsulation PID). You also have to configure the bitrate of the encapsulated mux.

It is also possible to have an IP Output in a multicast IP in order to monitor signal before ASI.



If we want the service encrypted, by clicking on the “Encryption” button it is possible to select the Scrambling Control Group.



Once the Scrambling Control Group has been selected, it is possible to associate ECM flows by clicking “Add”.

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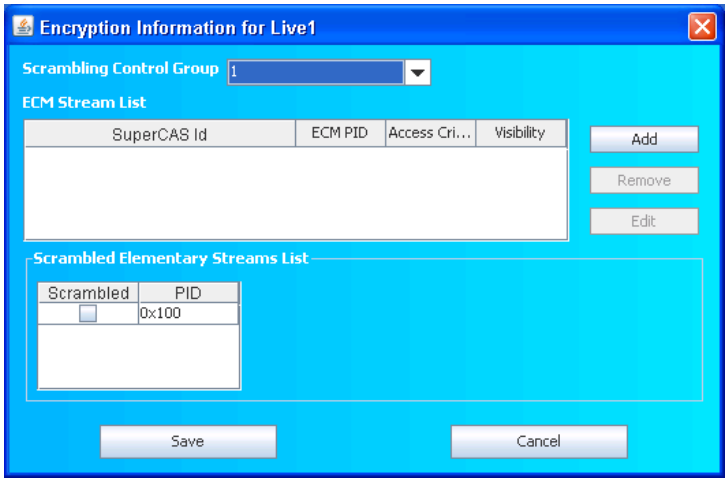
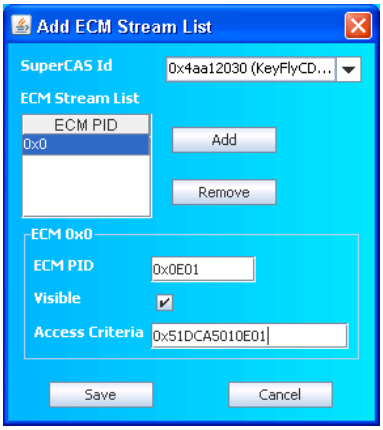
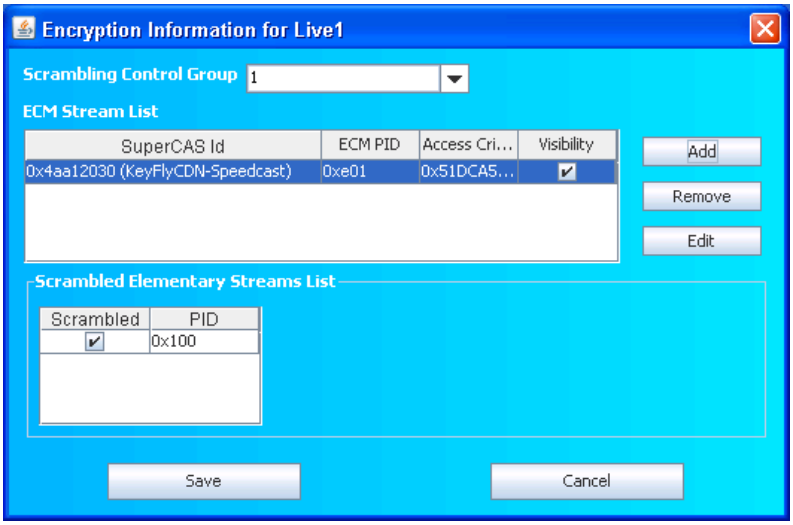


Select the SuperCAS Id of the CAS provider we want to use (in this case KeyFly), then ECM PID and Access Criteria have to be defined.



Note: Access Criteria is formed by: 0x51DCA5ZZYYYY where ZZ is right id associated to this service and YYYY is ECM PID of the service

The ECM Stream List shows the ECM configured for each service.



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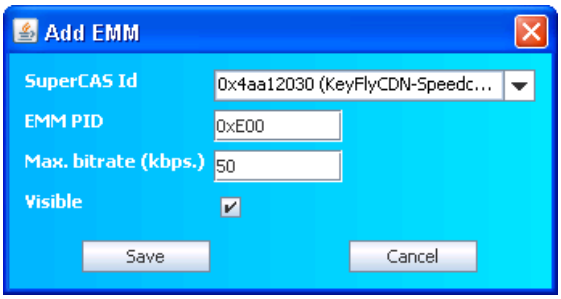
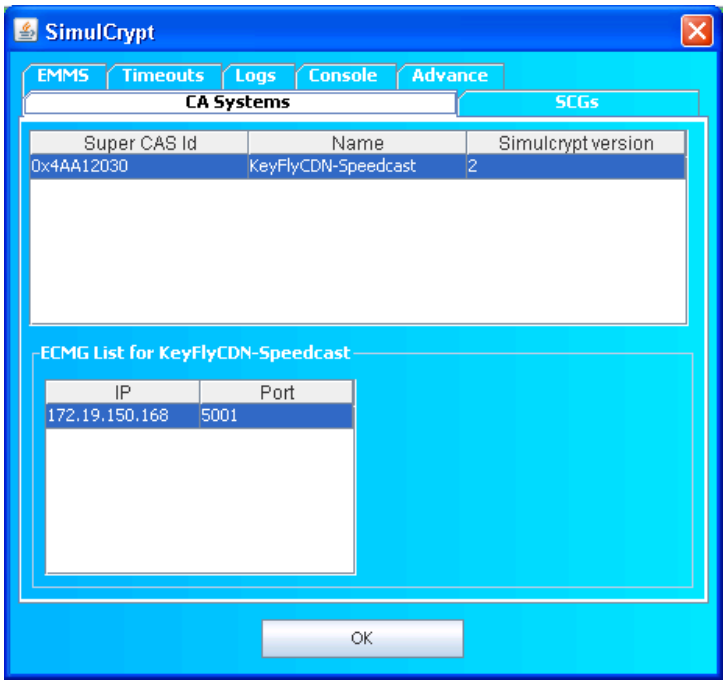
The next step is to Add EMM flows.



The last step consists on the SimulCrytp configuration. Mainly the ECM Generator flow (IP/port) per each CA System.



An then defining each Scrambling Control Groups (SCGs)

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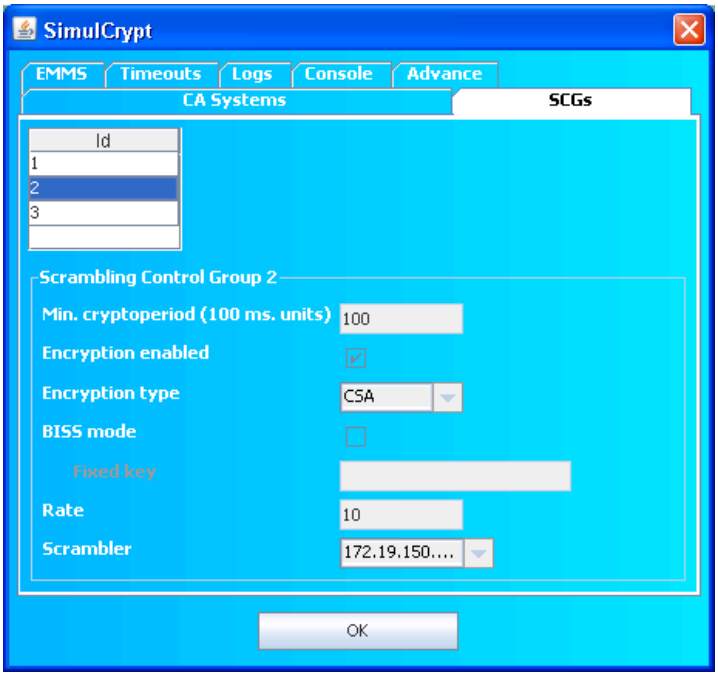
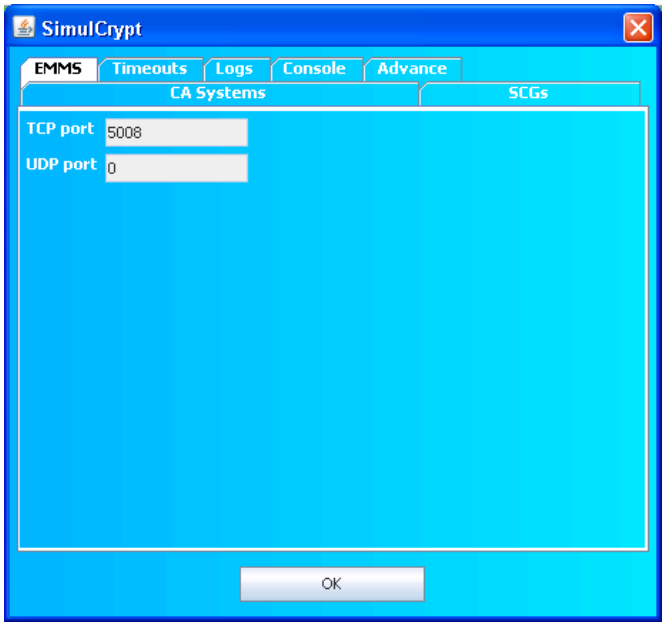


For the EMMS the port (UDP/TCP) has to be defined.



6.3.2 Configuration of the reception/decryption operation

The first step is to connect to the ORION Receiver. This device receives and decrypts the encapsulated signal. To tune to the corresponding transponder it is necessary to follow the same steps than in 2.4 to DVB-S/S2 boards. Polar Plus Manager User Guide to DVB-S/S2 boards. (Please, refer to this chapter to manually or automatic search).

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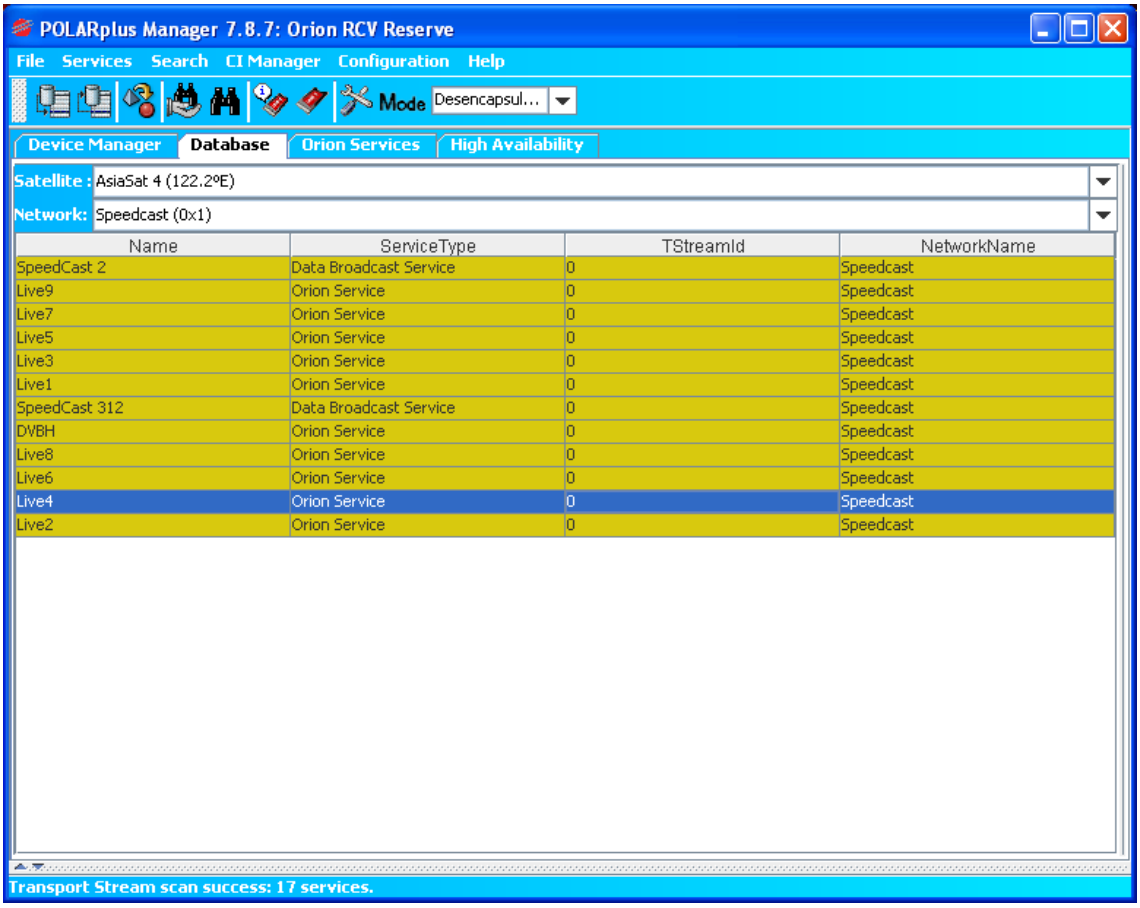
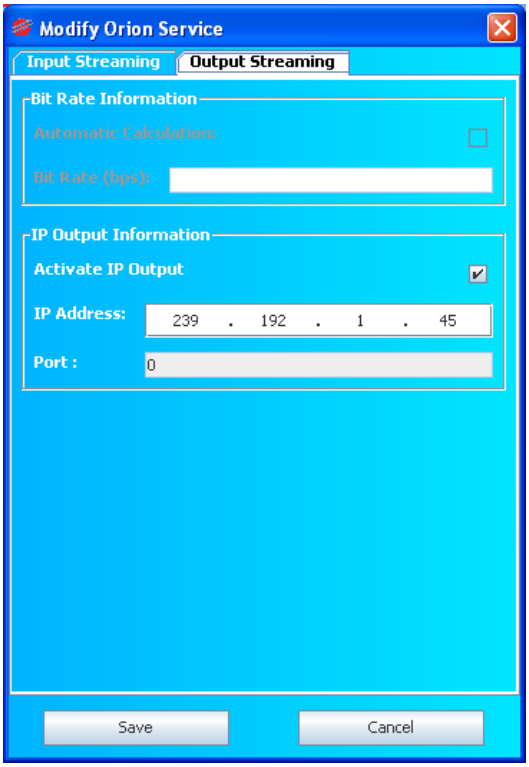

POLARplus Manager 7.8.7: Orion RCV Reserve
File Services Search CI Manager Configuration Help
Mode Desencapsul...
Device Manager Database Orion Services High Availability
Satellite : AsiaSat 4 (122.2°E)
Network: Speedcast (0x1)
Name ServiceType TStreamId NetworkName
SpeedCast 2 Data Broadcast Service 0 Speedcast
Live9 Orion Service 0 Speedcast
Live7 Orion Service 0 Speedcast
Live5 Orion Service 0 Speedcast
Live3 Orion Service 0 Speedcast
Live1 Orion Service 0 Speedcast
SpeedCast 312 Data Broadcast Service 0 Speedcast
DVBH Orion Service 0 Speedcast
Live8 Orion Service 0 Speedcast
Live6 Orion Service 0 Speedcast
Live4 Orion Service 0 Speedcast
Live2 Orion Service 0 Speedcast
Transport Stream scan success: 17 services.

Once the search has been completed we have to select the desired services for deencapsulating. And check that IP output is activated (by default it is).



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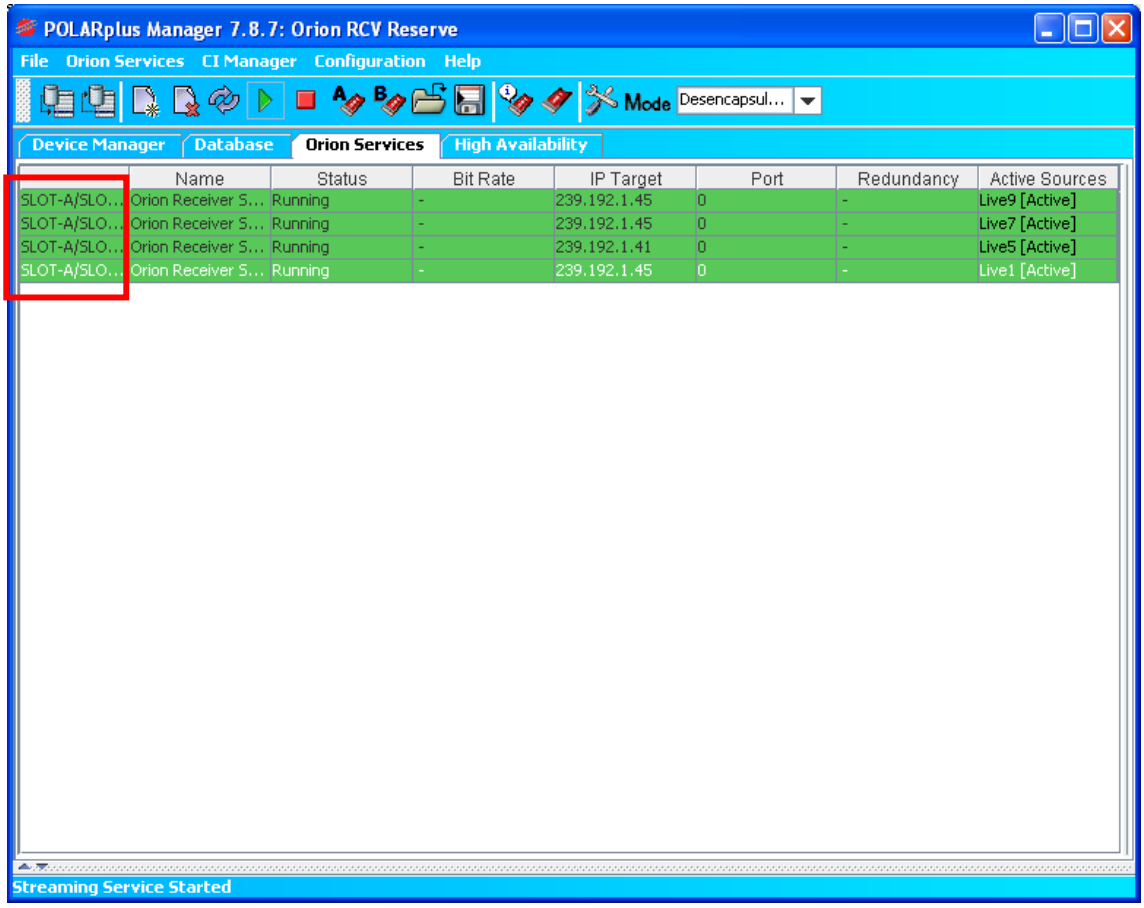
If the received streams will be obtained through the ASI output interface the Bit Rate has to be defined. If the received streams will be obtained through the Ethernet interface, the IP Output has to be activated and also the unicast destination address or the multicast address has to be defined.

Last, if the service is encrypted, we have to indicate in which slot the CAM is inserted (recommended to select both slots).



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7 Content Protection Devices

POLARplus Manager is an application that allows the **search**, **monitoring** and **configuration** of the POLARplus devices grouped under the category of *Content Protection Devices*. Inside this category the following type of devices are found:

- **keyFly CDN Encrypter**
- **keyFly CDN Decrypter**

All the explanations showed in this chapter apply on this type of devices, and from now to chapter end they will be referred as “devices”.

Using *POLARplus Manager* on these devices, we will be able to carry out some management tasks, as well as the configuration of the encryption/decryption operation.

The **management tasks** are:

- Device settings configuration. These settings are the name, network settings and querying status.
- Update of the firmware embedded on the device.
- Reset of the device, keeping its previous configuration.
- Suspend and resume the encryption/decryption operation.

By default, these devices will encrypt/decrypt absolutely all the incoming transport stream. The **configuration** of both device types is very similar, and basically will consist of electing the PIDs list to be excluded from encryption/decryption operation. The PIDs included in this list will be passed through to the output, but the rest of incoming PIDs will be encrypted/decrypted using the proprietary algorithm KeyFlyCDN. Normally, it is recommended that PIDs associated to the SI/PSI tables will not be encrypted (at least PAT, CAT, NIT and SDT), so they will be included in the excluded PIDs list. In this way, these PIDs will be identified by any DVB receiver with no problem.

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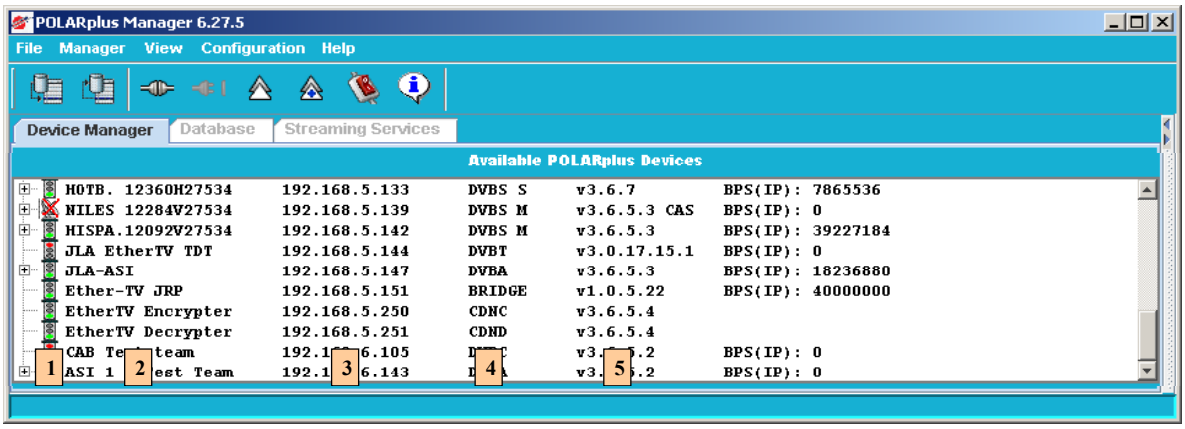
7.1 Searching devices

The search for the *KeyFly CDN Encrypter / Decrypter* existing in the local network is automatic. The application continuously shows an updated list of devices in the local network, indicating their status. *KeyFly CDN Encrypter / Decrypter* devices present the text **CDNE** and **CDND** respectively next to the IP address.

This information is presented in “Device Manager” tab, and can be seen in the following figure.


POLARplus Manager 6.27.5
File Manager View Configuration Help
Device Manager
Database
Streaming Services
Available POLARplus Devices
H0TB. 12360H27534 192.168.5.133 DVBS S v3.6.7 BPS(IP): 7865536
NILES 12284V27534 192.168.5.139 DVBS M v3.6.5.3 CAS BPS(IP): 0
HISPA.12092V27534 192.168.5.142 DVBS M v3.6.5.3 BPS(IP): 39227184
JLA EtherTV TDT 192.168.5.144 DVBT v3.0.17.15.1 BPS(IP): 0
JLA-ASI 192.168.5.147 DVBA v3.6.5.3 BPS(IP): 18236880
Ether-TV JRP 192.168.5.151 BRIDGE v1.0.5.22 BPS(IP): 40000000
EtherTV Encrypter 192.168.5.250 CDNC v3.6.5.4
EtherTV Decrypter 192.168.5.251 CDND v3.6.5.4
1
2
3
4
5

The information showed for every device is the following:

(1) Device Status. The meaning of the possible values is:

- Green light: the device is encrypting/decrypting to the output what is incoming according to the excluded PIDs list.
- Red light: the device is not encrypting/decrypting. The device is suspended: the output transport stream is exactly the same than the input one.
- No symbol (Board OFF): the device becomes not present (temporal status).
- Question mark: the device has been manually connected.

(2) Device Name.

(3) Device IP address.

(4) POLARplus device type, which in case of *KeyFly CDN Encrypter/Decrypter* devices will be one of the following values:

- **CDNE**: KeyFly CDN Encrypter.
- **CDND**: KeyFly CDN Decrypter.

(5) Firmware version embedded on device.

We can obtain more information about a given device selecting it with the mouse and using the right button to execute ‘**More Info**’ ( ). The additional information is in relation with the firmware version embedded on device.

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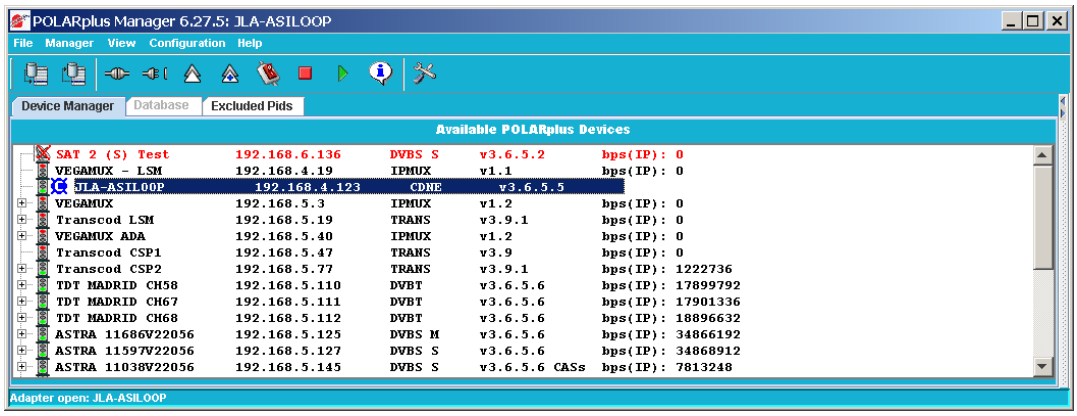
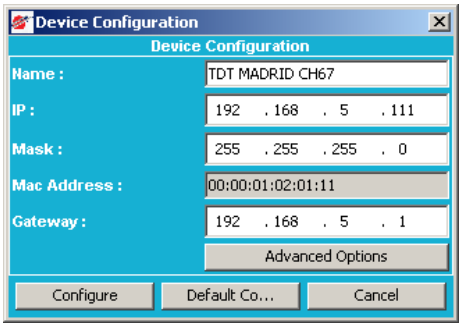
7.2 Management Tasks

The management commands are applied to the **selected** device (highlighted line), but not the “Set Mode” and “Device Settings” commands that are applied to the device **“connected”** (symbol **“C”**). In the following figure you can see that the selected device, and the device connected can be different ones. A selected device is done by a simple click on the desired device, and a device connected can be by three different ways: doing a double click on the device, or selecting the device (simple click) and either clicking the ‘Connect’ icon ( ), or doing the menu option “Manager/Connect”.

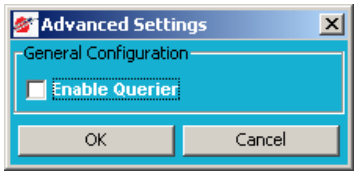

POLARplus Manager 6.27.5: JLA-ASILOOP
File Manager View Configuration Help
Device Manager Database Excluded Pids
Available POLARplus Devices
SAT 2 (S) Test 192.168.6.136 DVBS S v3.6.5.2 bps(IP): 0
VEGAMUX - LSM 192.168.4.19 IPMUX v1.1 bps(IP): 0
JLA-ASILOOP 192.168.4.123 CDNE v3.6.5.5
VEGAMUX 192.168.5.3 IPMUX v1.2 bps(IP): 0
Transcod LSM 192.168.5.19 TRANS v3.9.1 bps(IP): 0
VEGAMUX ADA 192.168.5.40 IPMUX v1.2 bps(IP): 0
Transcod CSP1 192.168.5.47 TRANS v3.9 bps(IP): 0
Transcod CSP2 192.168.5.77 TRANS v3.9.1 bps(IP): 1222736
TDT MADRID CH58 192.168.5.110 DVBT v3.6.5.6 bps(IP): 17899792
TDT MADRID CH67 192.168.5.111 DVBT v3.6.5.6 bps(IP): 17901336
TDT MADRID CH68 192.168.5.112 DVBT v3.6.5.6 bps(IP): 18896632
ASTRA 11686V22056 192.168.5.125 DVBS M v3.6.5.6 bps(IP): 34866192
ASTRA 11597V22056 192.168.5.127 DVBS S v3.6.5.6 bps(IP): 34868912
ASTRA 11038V22056 192.168.5.145 DVBS S v3.6.5.6 CASs bps(IP): 7813248
Adapter open: JLA-ASILOOP

7.2.1 Configuration of the device parameters

We can configure the device parameters by clicking the menu option “Configuration/Device Settings” ( ). These parameters are: name (the default value is “Ether-TV”), network settings (IP address, net mask and gateway address) and “querying” status. This last parameter is inside “Advanced Options”.


Device Configuration
Device Configuration
Name : TDT MADRID CH67
IP : 192 . 168 . 5 . 111
Mask : 255 . 255 . 255 . 0
Mac Address : 00:00:01:02:01:11
Gateway : 192 . 168 . 5 . 1
Advanced Options
Configure
Default Co...
Cancel

The “querying” status parameter is in relation with the multicasting management. Normally, the multicast traffic generated by these devices is distributed through routers and switches that must support IGMPv2. In these distribution networks there must be a “querier” that generates ‘IGMP query’ messages. This function is generally made by a router/switch, but if it is not present you can configure an only one device to perform this function. The port of the switch or router where this “querying” device is attached to, must support all the multicasting traffic existing in this switch/router. The “querying” status of the device can be displayed and modified in “Enable Querier” tick.



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7.2.2 Firmware Update

The *POLARplus Manager* presents the option to update the firmware embedded in the selected device or in all devices existing in the local segment, by clicking the menu options “Manager/Upload” and “Manager/Upload ALL” (and respectively). In both cases, a dialog window comes up, inviting you to introduce the binary file to upload. Once the firmware update is finished, the device will be restarted.

7.2.3 Initialization

The menu option “Manager/Reset” allows initializing the selected device, leaving intact the current configuration.

7.2.4 Suspend and Resume

The menu options “Manager/Suspend”, “Manager/Resume”, “Manager/Suspend ALL”, and “Manager/Resume ALL”, allows suspending or resuming the selected device or all existing devices in the local network (and respectively in the icon bar).

The device suspension implies that the device stops encrypting/decrypting, so the output transport stream will be exactly the same than the input one. As a consequence of suspension, the traffic light of the device will change to red.

When we resume the device, the device will return to encrypt/decrypt and the traffic light will become green.

A device initialization caused by either a hardware reset or a command from the application (Upload and Reset), implies a resume of the all suspended services.

7.2.5 Events Logging

There are two buttons (arrows) in the right border of the main window in order to maximize or minimize the logging window. This window contains a registration of all the events related to any change of the status in the devices or its associated services. Besides, it includes a registration of the commands executed from menu option “Manager”.

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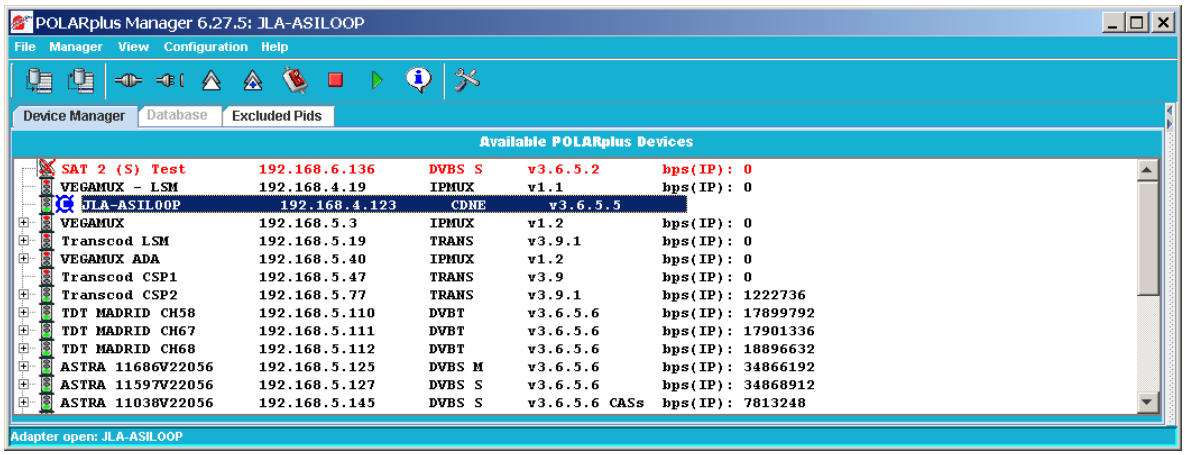
7.3 Configuration

In order to configure a device, firstly we must **connect** it. We remind you that a board connected is set up by three different ways: doing a double click on the device, or selecting the device (simple click) and either clicking the 'Connect' icon, or doing the menu option "Manager/Connect".

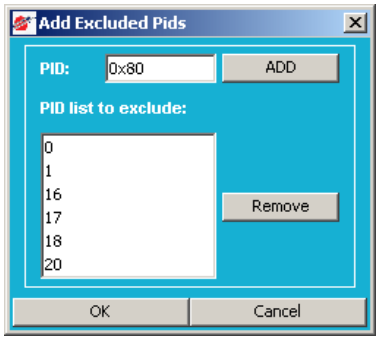

POLARplus Manager 6.27.5: JLA-ASILOOP
File Manager View Configuration Help
Device Manager
Database
Excluded Pids
Available POLARplus Devices
SAT 2 (S) Test 192.168.6.136 DVBS S v3.6.5.2 bps(IP): 0
VEGAMUX - LSM 192.168.4.19 IPMUX v1.1 bps(IP): 0
JLA-ASILOOP 192.168.4.123 CDNE v3.6.5.5
VEGAMUX 192.168.5.3 IPMUX v1.2 bps(IP): 0
Transcod LSM 192.168.5.19 TRANS v3.9.1 bps(IP): 0
VEGAMUX ADA 192.168.5.40 IPMUX v1.2 bps(IP): 0
Transcod CSP1 192.168.5.47 TRANS v3.9 bps(IP): 0
Transcod CSP2 192.168.5.77 TRANS v3.9.1 bps(IP): 1222736
TDT MADRID CH58 192.168.5.110 DVBT v3.6.5.6 bps(IP): 17899792
TDT MADRID CH67 192.168.5.111 DVBT v3.6.5.6 bps(IP): 17901336
TDT MADRID CH68 192.168.5.112 DVBT v3.6.5.6 bps(IP): 18896632
ASTRA 11686V22056 192.168.5.125 DVBS M v3.6.5.6 bps(IP): 34866192
ASTRA 11597V22056 192.168.5.127 DVBS S v3.6.5.6 bps(IP): 34868912
ASTRA 11038V22056 192.168.5.145 DVBS S v3.6.5.6 CASs bps(IP): 7813248
Adapter open: JLA-ASILOOP

We can configure a device not listed (the application couldn't detect it), if we know that it is available (check by a **ping** to the IP address using a command console) and we know its IP address. We have to click in the menu option "Manager/Manual connection". If the application achieves to connect the device, this will be added to the list with an unknown state (?).

7.3.1 Configuration of the encryption/decryption operation

As we have said before, by default these devices encrypts/decrypts absolutely all the incoming transport stream. The configuration of both device types is very similar, and basically consists of electing the PIDs list to be excluded from encryption/decryption operation. The PIDs included in this list will be passed through to the output, but the rest of incoming PIDs will be encrypted/decrypted using the proprietary algorithm KeyFlyCDN. Normally, it is recommended that PIDs associated to the SI/PSI tables will not be encrypted (at least PAT, CAT, NIT and SDT), so they will be included in the excluded PIDs list. In this way, these PIDs will be identified by any DVB receiver with no problem.

The excluded PIDs list configured into KeyFly CDN Encrypter and Decrypter should be the same in order to get a proper operation. The building of the excluded PIDs list is done from "Excluded Pids" tab, by menu option "Excluded Pids->Add Excluded Pids" ( ), as it is shown in the next figure:



When you click on "OK" button, the encryption/decryption operation, in case it is started, will be updated according the new list.

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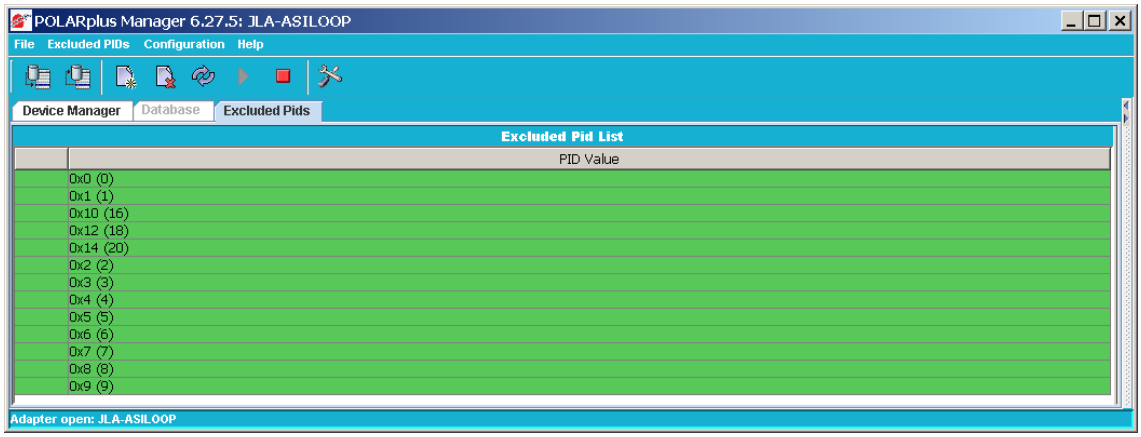
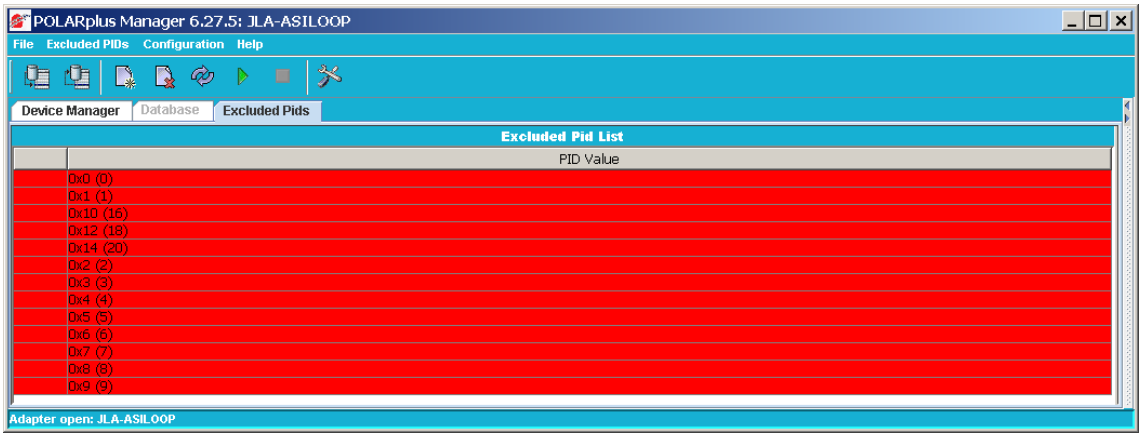


At any moment we can remove one or some PIDs from the Excluded PID list by selecting PIDs and clicking either on the icon, or the menu option “Excluded PIDs/Remove Excluded PIDs”.

From “Excluded Pids” tab, also we can start or stop the encryption/decryption operation, clicking on and ‘ icons respectively, or using their corresponding menu options. In case of stopping operation, the PIDs list and the traffic light associated to the device in “Device Manager” tab will become in red color.



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8 Redundancy Management

POLARplus Manager controls the redundancy management in group of devices that build up a transport stream in ASI format. POLARplus Manager monitors the right performance of a group, and in case of fail and depending on the redundancy configuration, will control an ASI switch to select the right ASI output coming from the well working group. This redundancy management presents a 1+1 scheme and is normally applied to DVB-T/H headends operation.

The redundancy management is applied on a **cluster**. A cluster is a set of two groups of devices; one is defined as **primary group** and the other one as **secondary group**. Each group consists of different "connected" devices that build up a transport stream in ASI format. It is supposed that both groups are made up of similar devices in order to build an identical transport stream.

The cluster is associated to an ASI switch device with two inputs and one output. The outputs of the primary and secondary groups are connected to the ASI switch inputs. By default, the output of the ASI switch is the output of the primary group; in case POLARplus Manager detects a not correct operation in any device of the primary group, it will switch to the output of the secondary group if its devices are OK. The cluster architecture can be shown in the following figure.

In case any device or service configured in the switched group is "not running" (stop or wait: red or yellow colours), POLARplus Manager will check the device operation in the other group to switch to it.

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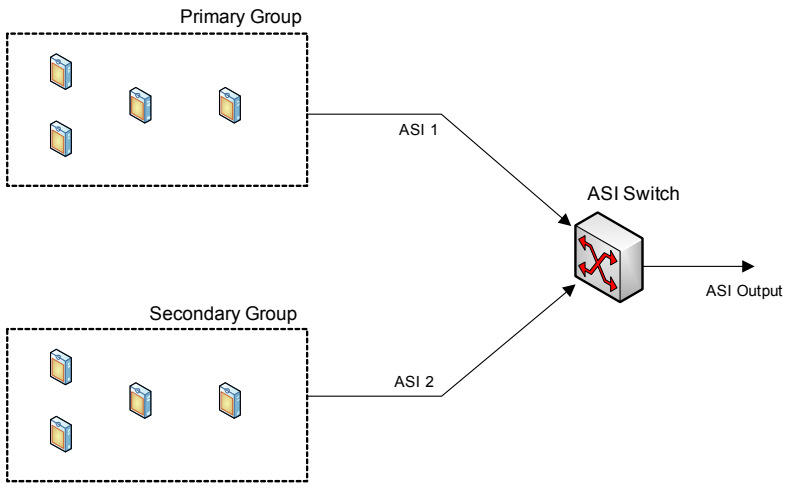


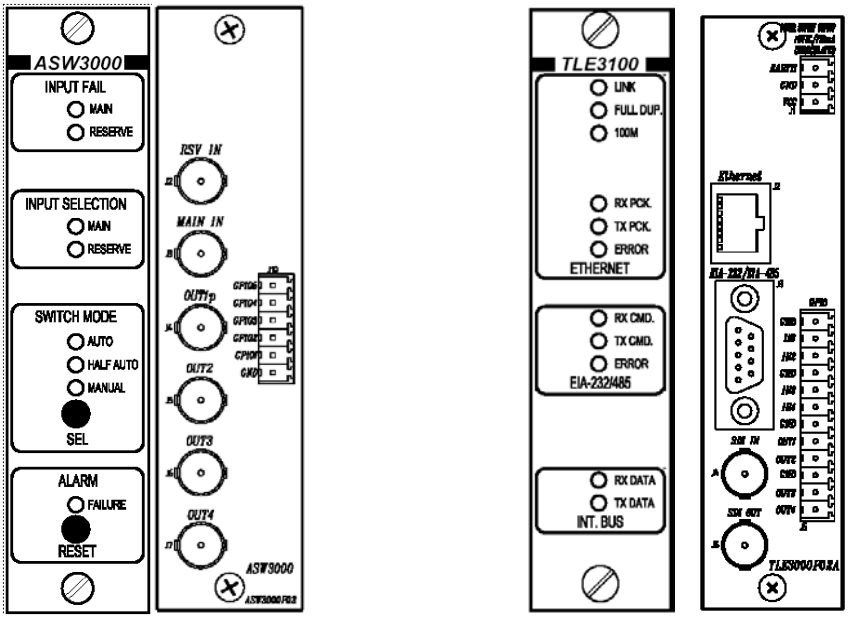
8.1 ASI Switch

The ASI Switch used in POLARplus Systems to control the redundancy in clusters is the **ASW3000** module of Albala Ing. This module and its control module TLE3100 are housed in 1RU. A front and rear view of both modules can be shown in the following figure.

In ASW3000 module, the ASI Main input (MAIN IN) has to be connected to the primary group output, and the Reserve one (RSV IN) to the secondary group output. The switched input is distributed to the four outputs, so any of them can be used. Meanwhile the control module, **TLE3100** has to be connected to the local network using its Ethernet connector.

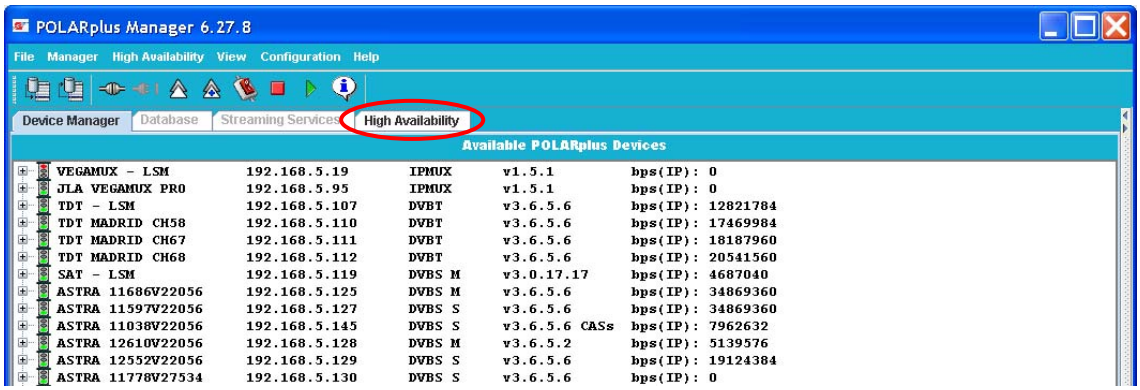
When redundancy management is controlled by POLARplus Manager the switch mode on ASW3000 is set to MANUAL mode. In order to know in more detail the meaning of the different leds, and the ASW3000 and TLE3100 modules operation, see the "asw3000man" and "tle3100man" documents.

There can be another redundancy scenarios, directly configured and controlled on ASW3000 module based on different conditions (no input signal, synchronization loss, error or discontinuities in PAT, bitrates greater or loss than configured, etc…). These scenarios are not controlled by POLARplus Manager.



8.2 Configuration

In order to configure the redundancy management through POLARplus Manager, it is necessary a licence valid for it; your licence is valid to manage redundancy if "**High Availability**" tab is visible in the main window as you can see in the following figure.


POLARplus Manager 6.27.8
File Manager High Availability View Configuration Help
Device Manager
Database
Streaming Services
High Availability
Available POLARplus Devices
VEGAMUX - LSM 192.168.5.19 IPMUX v1.5.1 bps(IP): 0
JLA VEGAMUX PRO 192.168.5.95 IPMUX v1.5.1 bps(IP): 0
TDT - LSM 192.168.5.107 DVBT v3.6.5.6 bps(IP): 12821784
TDT MADRID CH58 192.168.5.110 DVBT v3.6.5.6 bps(IP): 17469984
TDT MADRID CH67 192.168.5.111 DVBT v3.6.5.6 bps(IP): 18187960
TDT MADRID CH68 192.168.5.112 DVBT v3.6.5.6 bps(IP): 20541560
SAT - LSM 192.168.5.119 DVBS M v3.0.17.17 bps(IP): 4687040
ASTRA 11686V22056 192.168.5.125 DVBS M v3.6.5.6 bps(IP): 34869360
ASTRA 11597V22056 192.168.5.127 DVBS S v3.6.5.6 bps(IP): 34869360
ASTRA 11038V22056 192.168.5.145 DVBS S v3.6.5.6 CASs bps(IP): 7962632
ASTRA 12610V22056 192.168.5.128 DVBS M v3.6.5.2 bps(IP): 5139576
ASTRA 12552V22056 192.168.5.129 DVBS S v3.6.5.6 bps(IP): 19124384
ASTRA 11778V27534 192.168.5.130 DVBS S v3.6.5.6 bps(IP): 0

The list of available ASI switches (at this moment, it is only supported the ASW3000 module) in your network can be retrieved clicking on the "High Availability / ASI Switch Configuration" menu option in "High Availability" tab. At this point, it is possible to modify the network parameters of the ASI switches as you can see in the next figure. Each ASI switch can be associated with the management of an unique cluster.

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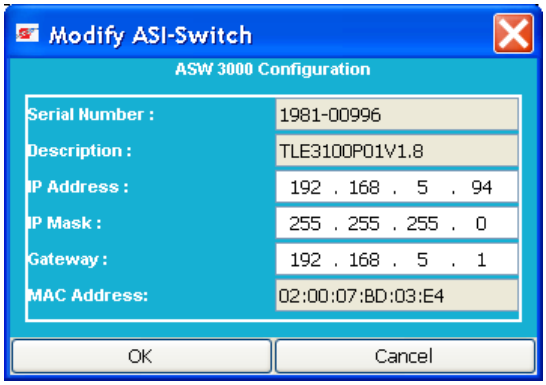

Before creating clusters it is mandatory to create the groups of devices involved in the redundancy management. We click on “Manager / Groups / Create Group” menu option selecting “Device Manager” tab. In the following window it is necessary to introduce the group identifier and select the POLARplus devices involved in the group. Only the POLARplus devices detected in the local network at this moment are in the list of “Available Devices”; No POLARplus devices can be included in the group configuration because they can not be monitored by POLARplus Manager.

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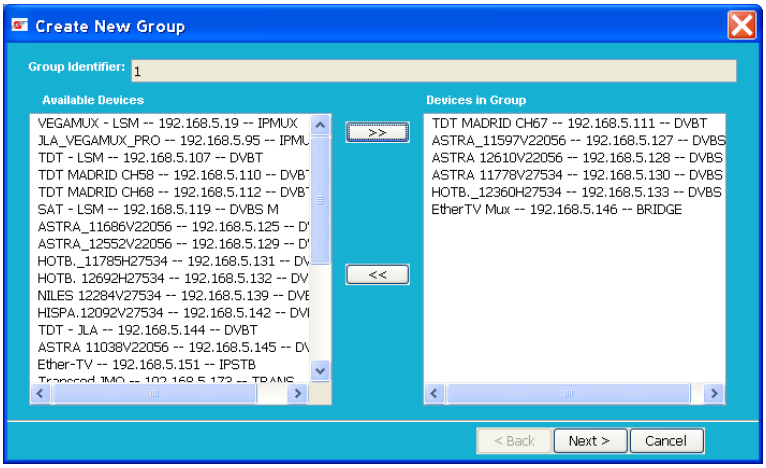
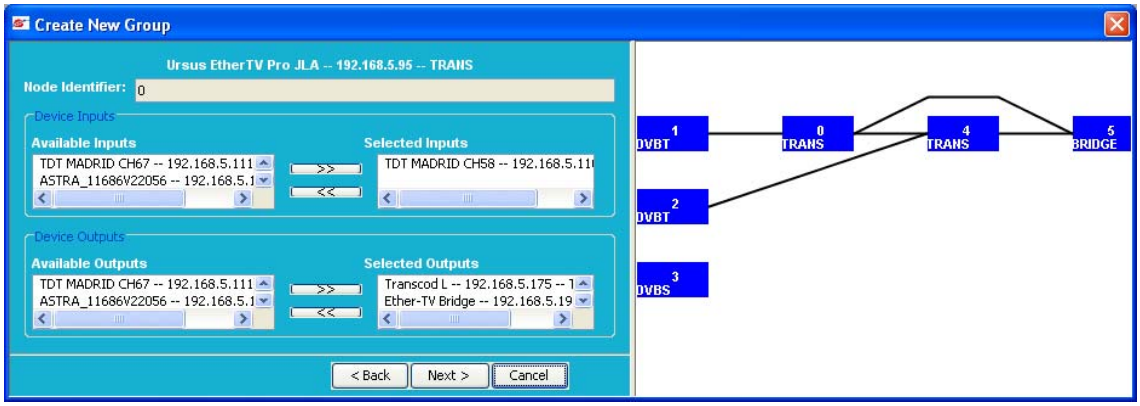
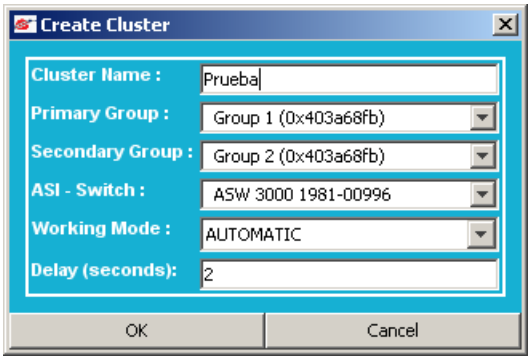


Once POLARplus devices have been selected click on “Next” button to define the input and output devices for each device in order to “connect” devices (see the graph on the right side). This operation is repeated for each device in the group.



Now, it is possible to create the Clusters, clicking on “High Availability / Create Cluster” menu option. It is necessary to define name, primary and secondary groups, ASI Switch to be used and working mode, as it is depicted in the next figure.



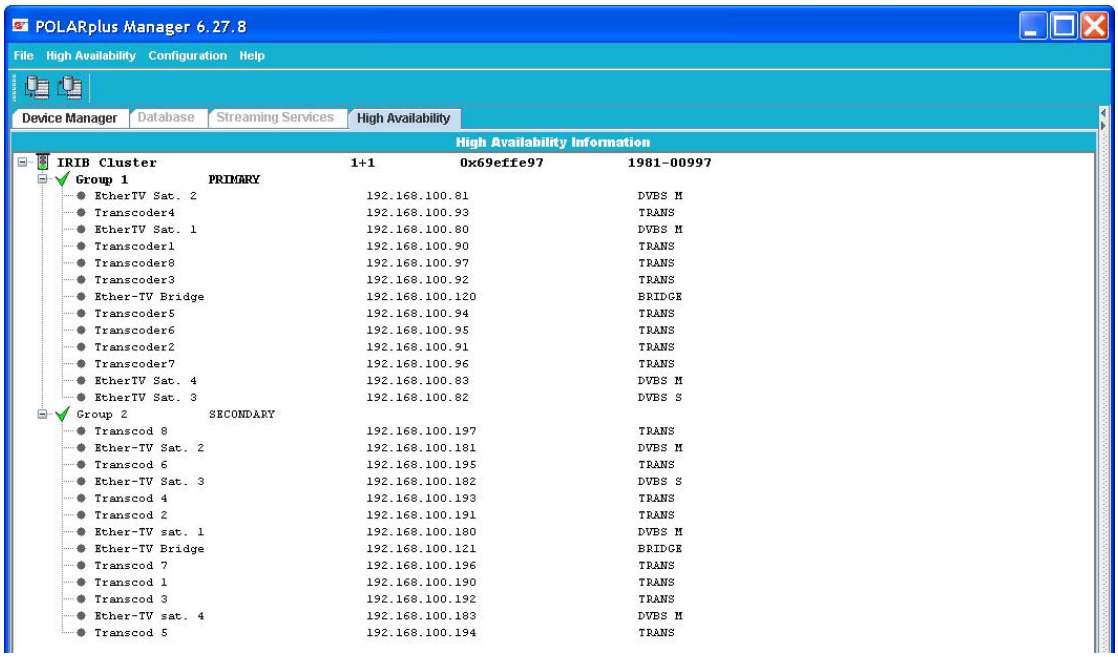
The working mode can be:

- **Automatic**: The switching from one to the other group output is done whenever the current group fails and the other one is OK. Once the fail condition is detected, the switching to reserve is immediately but the switching to main lasts the **delay** time to be executed.
- **Semi-automatic**: The switching from main to reserve group output is done whenever main group fails and the reserve one is OK. The switching from reserve to main only can be done using the manual switching.

When the cluster is created, it is started (green colour) so the redundancy management is active. While cluster is started, we will not be allowed to change the configuration of the ASI switch and any board included in that cluster. In order to change any configuration, we will have to stop it first from “High Availability” menu.

Other actions that can be done over a cluster from “High Availability” menu are: modify (cluster needs to be stopped), remove and change the active group (manual switching).

In the next figure, an example of cluster definition is shown, where the main group “Group 1” in **bold** is the switched one to the output.


POLARplus Manager 6.27.8
File High Availability Configuration Help
Device Manager Database Streaming Services High Availability
High Availability Information
IRIB Cluster 1+1 0x69effe97 1981-00997
Group 1 PRIMARY
EtherTV Sat. 2 192.168.100.81 DVBS M
Transcoder4 192.168.100.93 TRANS
EtherTV Sat. 1 192.168.100.80 DVBS M
Transcoder1 192.168.100.90 TRANS
Transcoder8 192.168.100.97 TRANS
Transcoder3 192.168.100.92 TRANS
Ether-TV Bridge 192.168.100.120 BRIDGE
Transcoder5 192.168.100.94 TRANS
Transcoder6 192.168.100.95 TRANS
Transcoder2 192.168.100.91 TRANS
Transcoder7 192.168.100.96 TRANS
EtherTV Sat. 4 192.168.100.83 DVBS M
EtherTV Sat. 3 192.168.100.82 DVBS S
Group 2 SECONDARY
Transcod 8 192.168.100.197 TRANS
Ether-TV Sat. 2 192.168.100.181 DVBS M
Transcod 6 192.168.100.195 TRANS
Ether-TV Sat. 3 192.168.100.182 DVBS S
Transcod 4 192.168.100.193 TRANS
Transcod 2 192.168.100.191 TRANS
Ether-TV sat. 1 192.168.100.180 DVBS M
Ether-TV Bridge 192.168.100.121 BRIDGE
Transcod 7 192.168.100.196 TRANS
Transcod 1 192.168.100.190 TRANS
Transcod 3 192.168.100.192 TRANS
Ether-TV sat. 4 192.168.100.183 DVBS M
Transcod 5 192.168.100.194 TRANS

VERY IMPORTANT: The redundancy is managed through the Polar Plus Manager software, so this software must be running all the time.

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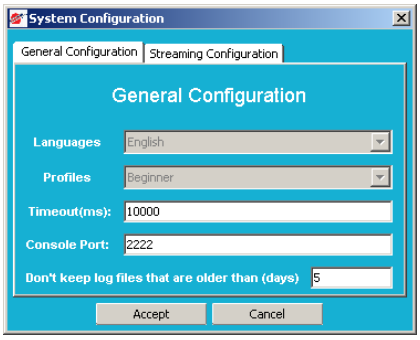
9 CONFIGURATION OF POLARplus Manager

This subject refers to the system configuration and in order to access it, you have to click on the menu option “Configuration/System Config”. We can configure general parameters of the application (language, profile and timeout) and IP address (class B) used to generate automatically the multicast address of the streaming services.

If you want to take back the default values of the previously mentioned parameters, you only have to click on the menu option “Configuration/Default Config.”.

9.1 General configuration

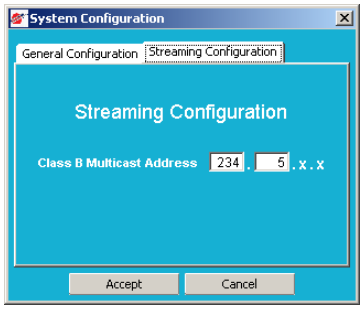
The general configuration is placed at “General Configuration” tab.



We can configure the language and the user profile (currently not implemented), and the timeout for communications between application and device. This value is expressed in milliseconds in “Time Out” field.

9.2 Configuration of the multicast address generation

In order to see or modify the multicast address seed, we have to place on the “Streaming Configuration” tab.



We can modify the class B address that application uses to generate the multicast addresses assigned to the streaming services at the starting time.

APPENDIX

A TROUBLESHOOTING

At this point we show possible problems or questions that can occur, and the steps to follow in order to solve it, or at least know its causes. It is supposed a proper hardware and software installations.

A.1 General

4. **The POLARplus device doesn't appear in the list of the Manager.**
   - Check that device is supplied and plugged to the network. In order to do this, check that leds corresponding to the power supply and ethernet link are ON. See "POLARplus_Installation_Guide.pdf" document to see the led placement.
   - Check that the device transmission led is either blinking or ON. In the case of a recent device power supplying, wait for no more than 30 seconds before checking.
   - Check in case of using Windows XP, that the Firewall is not enabled.
   - Check that the network between device and host (computer where the *POLARplus Manager* has been installed) lets pass through the multicast traffic generated by device in the multicast address 224.2.127.254 (multicast address for SAP). An alternative to discard this problem, is to connect directly the device to the host using a crossed cable, and check what happens in the list.

5. **The POLARplus device appears in the list but we can't connect to it, resulting the error message: "Error Opening the adapter".**
   - Check that the host has an IP address inside the range of the device IP.
   - Check that the network between device and host lets pass through the IP traffic in both directions. This can be done, executing a ping from the host to the device. An alternative to discard this problem is to connect directly the device to the host using a crossed cable, and execute the ping.

6. **The POLARplus device appears in the list but we can't connect to it, resulting the error message: "You don't have permissions to configure this board".**
   - Load the license file delivered by SIDSA using the menu option "File/Load Licence" and try the connection again.

7. **The POLARplus device appears in the list streaming out some services (traffic light and tick are green), but these services can not been displayed with Videolan player (VLC).**
   - Check that the device transmission led is ON. In the case of a recent device power supplying, wait for no more than a minute before checking.
   - Check in case that the host (computer where the VLC player has been installed) has more than a network interface, the network interface used to connect to the devices is configured as first for the OS (operating system). This is achieved either disabling the rest of interfaces, or enabling them subsequently in order to assure that the device one is the first.
   - Check that the network between device and host lets pass through the multicast traffic generated by the device in the multicast addresses corresponding to the services being streamed out. A way to discard this problem, is to do the next step with the device and host connected directly by a crossed cable.

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- Check that we are correctly using the Videolan player. We execute this application and click on the menu option “File/Open Network Stream”. In the window that comes out, we select the option “UDP/RTP multicast” and introduce the multicast address and port corresponding to the service we want to display.

8. **The POLARplus device appears in the list streaming out some services (traffic light and tick are green), but these services can not been displayed with a TV using the STB AMINO.**
    - Check that the device transmission led is ON. In the case of a recent device power supplying, wait for no more than a minute before checking.
    - Check that AMINO configuration is correct. See document “POLARplus_Players.pdf” to get more information.
    - Check that AMINO is alive, doing a “ping” from a machine that would be connected to AMINO, replacing momentarily the device.
    - Check that the services configured are streamed out using the mode UDP, and no other.
    - Check that the network between device and AMINO lets pass through the multicast traffic generated by the device in the multicast addresses corresponding to the services being streamed out. A way to discard this problem, is to connect directly an the device and the AMINO using a crossed cable, and check if the channels configured are displayed in the new situation.

A.2 DVB-IP Gateways

9. **The DVB-IP Gateway device appears in the list with the crossed antenna or red traffic light icons, and it is configured to do “streaming” (yellow ticks in services).**
    - Check the physical connection between antenna and device. In case of DVBS device, check that antenna is correctly oriented, and that LNB works properly and its characteristics are according to the LNB settings in the device.
    - Check, in case of DVBS device, that only a device amongst the possible ones that could share LNB, supplies the LNB; therefore, there is a device configured as MASTER, and its supply configuration (LNB settings) is automatic (for the level and tone).
    - Check, in case of DVBS device, that the services configured correspond to the satellite that is being pointed to.
    - Try to configure these services from scratch, doing a previously manual search in the transponder/channel where the services belong to.

10. **The DVB-IP Gateway device has been configured with several unicast streaming services as running, and we have problems in the communication from the configuration tool (repetitive errors in the connection and configuration of the device).**
    - Check that “host” has an IP address in the subnet of the device, and that there is communication with the device. This can be done making a “ping” command from the host to the device.
    - Try to suspend the device (this command should work), provoking a halt of the streaming from the device.
    - Try the connection and configuration of the device. If it works now, the explanation of the previous errors was the heavy traffic incoming the device. The host that receives a UDP packet on a port not opened generates an ICMP packet (unreachable port) to the source of the UDP packet, so the device receives a heavy ICMP traffic that can disturb the normal operation.

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- In conclusion, when you want to configure a device with unicast services, and you have problems in the connection to the device, we recommend you in this order: suspend, configure and resume the device.

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B Bitrate Calculation (EtherTV-Bridge)

A very precise bit rate value corresponding to a MPTS, modulated with COFDM, QPSK and QAM, can be calculated using the following formulas:

- **COFDM (DVB-T)**

$$Bitrate = \frac{423}{544} \cdot (Tbandwitdh \cdot TcodeRate \cdot Tconstellation \cdot TguardInterval)$$

- **QPSK (DVB-S)**

$$Bitrate = \frac{188}{204} \cdot (SymbolRate \cdot TcodeRate \cdot Tconstellation)$$

- **QAM (DVB-C)**

$$Bitrate = \frac{188}{204} \cdot (SymbolRate \cdot Tconstellation)$$

Where,

- *Tbandwidth* = {6000000, 7000000, 8000000} in Hz corresponding to 6, 7 and 8 MHz respectively.
- *TcodeRate* = {1/2, 2/3, 3/4, 5/6, 7/8}
- *Tconstellation* = {2 (QPSK), 4 (16QAM), 5 (32QAM), 6 (64QAM), 7 (128QAM) }
- *TguardInterval* = {4/5, 8/9, 16/17, 32/33} corresponding to 1/4, 1/8, 1/16 and 1/32 respectively.*SymbolRate* = value in symbols/s.

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